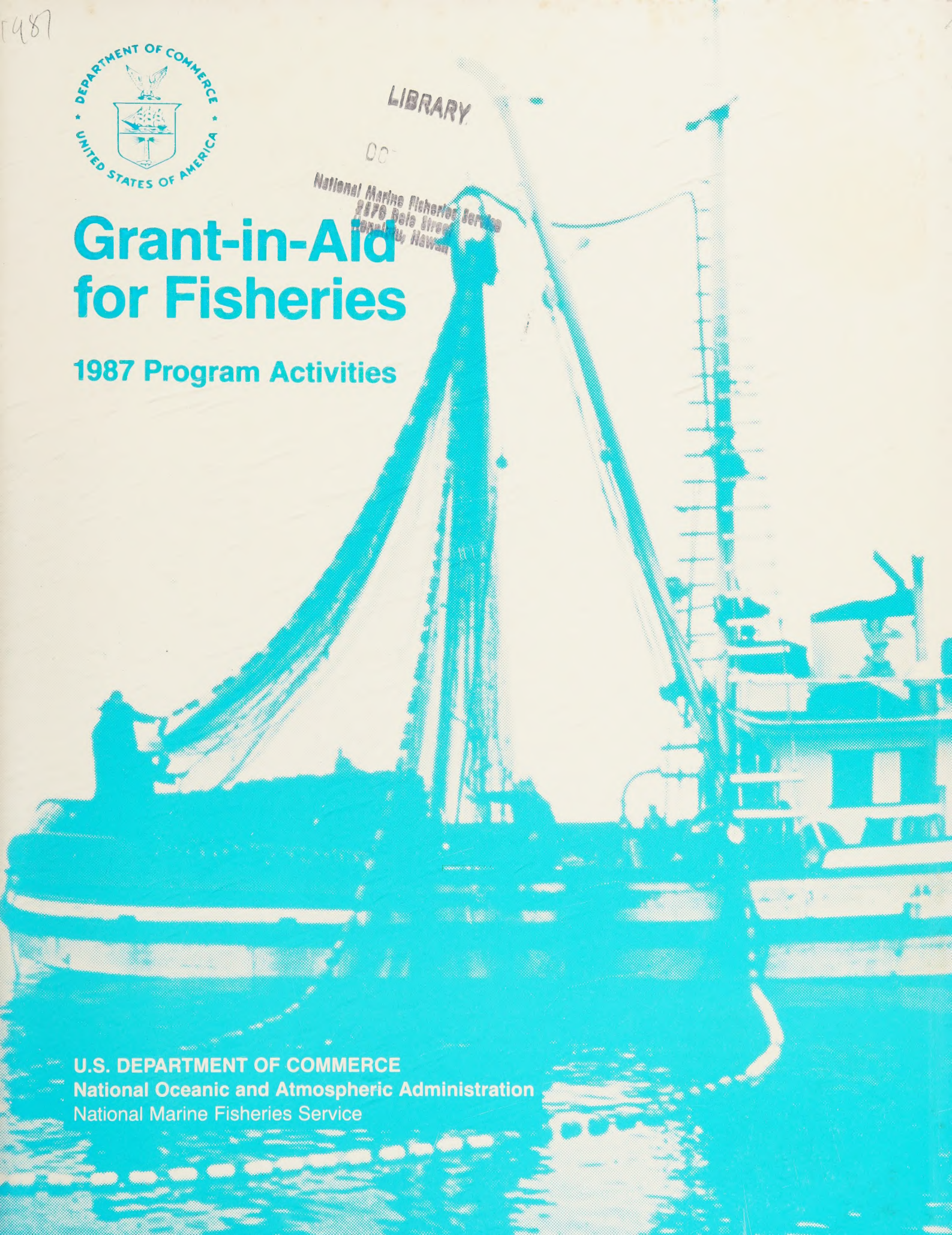
1487

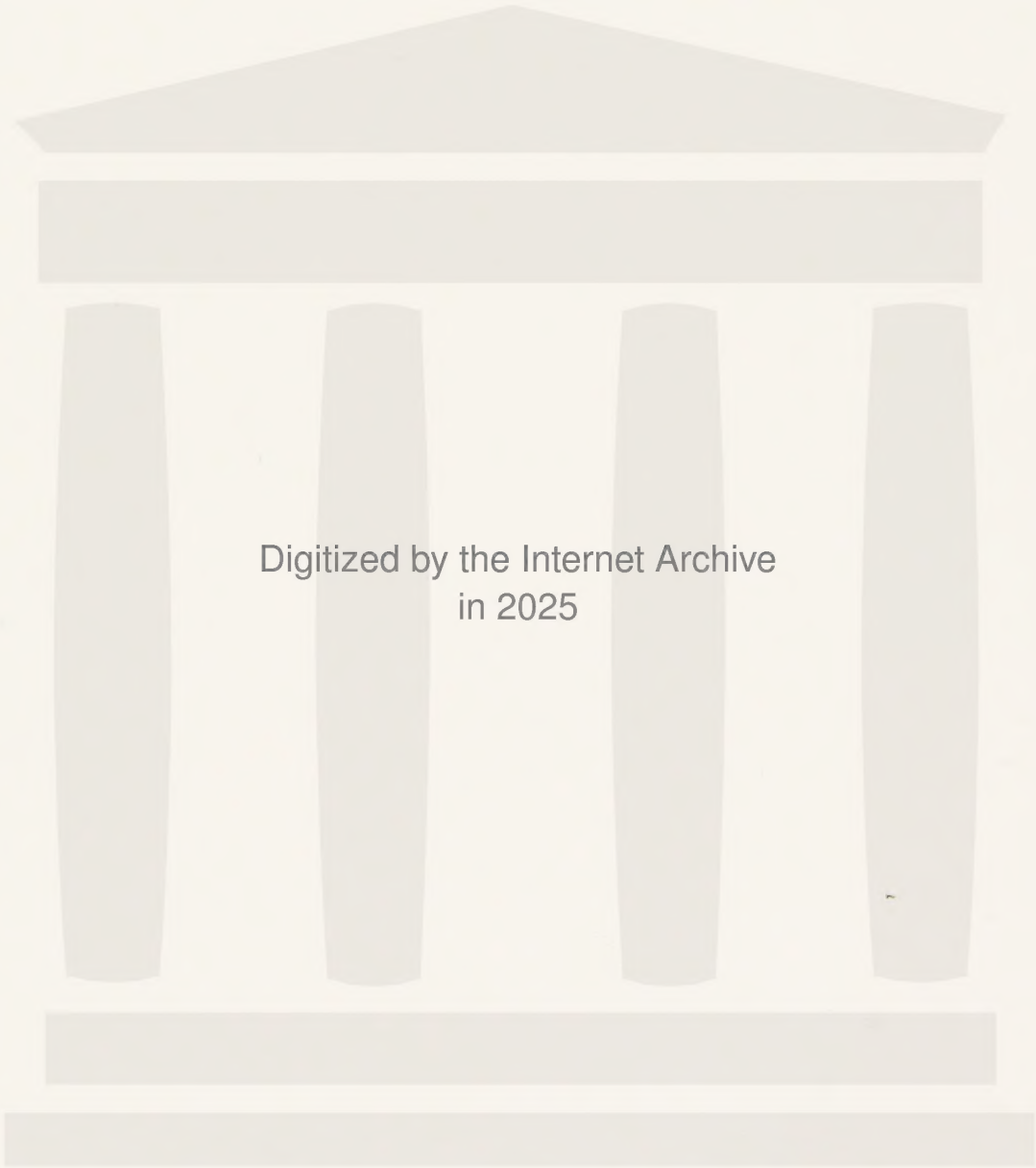
LIBRARY
OC
National Marine Fisheries Service
2570 Dole Street
Honolulu, Hawaii

Grant-in-Aid for Fisheries

1987 Program Activities



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service


Digitized by the Internet Archive
in 2025

https://archive.org/details/grant-aid-fisheries-program-activities_1987

U.S. Department of Commerce

C. William Verity, Secretary

National Oceanic and Atmospheric Administration
William E. Evans
Under Secretary for Oceans and Atmosphere

National Marine Fisheries Service
James W. Brennan
Assistant Administrator for Fisheries

GRANT-IN-AID FOR FISHERIES PROGRAM ACTIVITIES

This report prepared by the
Grant-in-Aid Staff
of the National Marine Fisheries Service
Harry Mears NMFS, Northeast Regional Office
Sally Long, NMFS, Southeast Regional Office
Jim Morgan, NMFS, Southwest Reegional Office
Janine Jijina, NMFS, Northwest Regional Office
Ron Berg, NMFS, Alaska Regional Office
Office of Fisheries Management
Edith McClure and Austin Magill
Recreational and Interjurisdictional
Fisheries Division
Washington D.C. Office, NMFS

October, 1988

AUTHORIZATION

This report is submitted in compliance with the requirement of Section 9(a) of the Fish and Wildlife Act of 1956, as amended, 16 U.S.C. 742d(7) and Section 2 of the Anadromous Fish Conservation Act of 1965, as amended, 16 U.S.C. 757b.

COVER PHOTO

Cover shows a salmon purse seiner, the **Joann**, in the waters of Puget Sound, Washington. Photo taken by Harvey Moore, who worked in the Northwest Regional Office, NMFS, Seattle, WA, but has since retired.

CONTENTS

PAGE

INTRODUCTION.....1

THE ACTS:
Commercial Fisheries Research and Development Act of 1964, Public Law 88-309, as amended.....1

Anadromous Fish Conservation Act of 1965, Public Law 89-304, as Amended.....1

APPORTIONMENT OF FEDERAL FUNDS BY STATE AND AUTHORIZATION.....2

CLASSIFICATION OF FEDERAL AND STATE FUNDS BY ACTIVITY AND AUTHORIZATION, FISCAL YEAR 1987.....3

PROJECT TITLES BY STATE AND PUBLIC LAW WITH OTHER PERTINENT INFORMATION, FISCAL YEAR 1987.....4

SPECIFIC PROJECT BREAKDOWNS.....5

PROGRAM ANALYSIS.....17

AQUACULTURE.....17

CONSTRUCTION.....18
Fisheries development and enhancement.....18

DISEASE AND PARASITE CONTROL.....18

EXTENSION SERVICE.....19

MARKET DEVELOPMENT.....19

RESEARCH
Finfish (Freshwater):
Baitfish.....20
Catfish.....20
Paddlefish.....20
Rainbow Smelt.....20
Trout.....21
Walleye.....21
Whitefish.....21
Yellow perch.....21
Others.....22

Finfish (Marine or Anadromous):
American shad and River Herring.....23
Atlantic sturgeon.....25
Groundfish.....25
Salmon.....25
Shortnose sturgeon.....27
Striped bass.....27
Tuna.....28

Shellfish:
Clams.....29
Crabs.....29

Crayfish....29
Lobster....29
Mussels....30
Oysters....30
Scallops....31
Shrimp....32
Squid....32

Gear Analysis....32

FISHERIES SURVEYS....32

STATISTICS....35

REGIONAL HIGHLIGHTS....39
Northeast Region....39
Southeast Region....40
Northwest Region....41
Southwest Region....43
Alaska Region....43

ADMINISTRATIVE ORGAINIZATIONS....46

Non Federal Cooperators....50

National Marine Fisheries Service....50

PUBLICATIONS....51

GRANT-IN-AID FOR FISHERIES

PROGRAM ACTIVITIES 1987

by

Grant-in-Aid Staff

INTRODUCTION

This is the 19th in a series of annual publications on program activities under the Grant-in-Aid for Fisheries Program of the Office of Fisheries Management, National Marine Fisheries Service (NMFS).

Information presented in this report provides State program coordinators and administrators, Federal personnel, project personnel, and others concerned with research, development, conservation, and management of our fishery resources with a convenient reference to the grant-in-aid program. This publication will also facilitate planning, coordination, and integration of State, Federal, and private sector activities concerned with the fishery resources.

THE ACTS

The NMFS Grant-in-Aid program is authorized under two Acts:

1. The Commercial Fisheries Research and Development Act of 1964 (Public Law 88-309 as amended) - Authorizes the Secretary of Commerce to cooperate with the 50 States, the Commonwealths of Puerto Rico and the Northern Mariana Islands, and the Governments of the Virgin Islands, Guam, American Samoa, and the Trust Territory of the Pacific Islands, in carrying out research and development of the Nation's commercial fisheries. Projects eligible for funding include research, development, construction, and coordination. Cost-sharing projects under subsection 4(a) are funded up to 75 percent level of Federal participation, whereas projects under subsection 4(b), to alleviate resource disasters, may be financed 100 percent with Federal funds. This Act would have expired June 1973; however, it was extended by Public Laws 92-590, 95-53, 96-62 and 97-389 for an additional 12 years, or to September 30, 1985. The authorized levels are $5 million for subsection 4(a), and $2.5 million for subsection 4(b). This law was repealed effective October 1, 1987, with the passage of the Interjurisdictional Fisheries Act of 1986, Title III of Public Law 99-659.

2. The Anadromous Fish Conservation Act of 1965 (Public Law 89-304 as amended) - Authorizes the Secretary of Commerce and the Secretary of Interior to enter into cooperative agreements with States and other non-Federal interests for the conservation, development, and enhancement of the anadromous fishery resources of the Nation and the fish in the Great Lakes and Lake Champlain that ascend streams to spawn, and for the control of the sea lamprey. The program is administered at the Federal level jointly by the National Marine Fisheries Service and the U.S. Fish and Wildlife Service. Federal funds up to 50 percent, 66 2/3 percent when two or more States cooperate, or 90% to carry out projects required by interstate fishery management plans, may be used to finance project costs. State fishery agencies, colleges, universities, private companies, and other non-Federal interests in 31 States bordering the oceans and the Great Lakes may participate under the Act. All projects must be coordinated with the State fishery agency concerned. The authorization for this Act was renewed November, 1986 by Title III of PL 99-659. This Act set authorized levels of $7,702,500 for fiscal year 1987, $7,920,000 for fiscal year 1988 and $8,152,500 for fiscal year 1989 for grants under Section 4. Section 7, the emergency research program was reauthorized for fiscal years 1987 and 1988 at $1 million each year by P.L. 99-432.

APPORTIONMENT OF FEDERAL FUNDS BY
STATE AND AUTHORIZATION

Distribution of Federal funds to the States and others under the National Marine Fisheries Service grant-in-aid for fisheries program (Public Law 88-309 and Public Law 89-304) in Fiscal Year 1987, is given in the following tabulation: Cumulative total reflects funding since inception of the Programs.

STATE AND OTHERS	FY 1987		CUMULATIVE TOTAL		GRAND TOTAL
	P.L. 88-309	P.L. 89-304	P.L. 88-309 ($1,000)	P.L. 89-304	($1,000)
ALABAMA	$ 152,000	$ 18,000	$ 4,170.2	$ 871.2	$ 5,041.4
ALASKA	240,000	450,000	5,496.0	9,578.0	15,074.0
ARIZONA	20,000	-	458.4	-	458.4
ARKANSAS	35,000	-	645.4	-	645.4
CALIFORNIA	240,000	405,000	5496.0	6,742.0	12,238.0
COLORADO	20,000	-	458.4	-	458.4
CONNECTICUT	20,000	45,000	658.4	594.0	1,252.4
DELAWARE	36,000	-	642.1	84.0	726.1
FLORIDA	240,000	-	5648.0	91.0	5,739.0
GEORGIA	57,200	24,500	1847.2	190.1	2,037.3
HAWAII	27,700	-	731.0	-	731.0
IDAHO	20,000	-	577.4	-	577.4
ILLINOIS	20,000	-	470.4	21.0	491.4
INDIANA	20,000	-	458.4	-	458.4
IOWA	20,000	-	460.4	-	460.4
KANSAS	20,000	-	460.4	-	460.4
KENTUCKY	20,000	-	460.4	-	460.4
LOUISIANA	240,000	-	8571.0	89.0	8,660.0
MAINE	157,700	69,400	4085.1	1.030.4	5,115.5
MARYLAND	107,300	119,000	4001.5	1,511.1	5,512.6
MASSACHUSETTS	240,000	123,000	6462.0	1,462.0	7,924.0
MICHIGAN	20,000	-	929.4	569.0	1,498.4
MINNESOTA	20,000	-	548.4	23.0	571.4
MISSISSIPPI	236,500	-	4497.2	468.0	4,965.2
MISSOURI	20,000	-	484.2	20.0	504.2
MONTANA	20,000	-	458.4	-	458.4
NEBRASKA	20,000	-	460.4	-	460.4
NEVADA	20,000	-	458.4	-	458.4
NEW HAMPSHIRE	24,200	-	678.6	1,318.0	1,996.6
NEW JERSEY	82,800	12,500	2720.7	274.5	2,995.2
NEW MEXICO	20,000	-	460.4	-	460.4
NEW YORK	71,500	82,000	3018.7	720.5	3,739.2
NORTH CAROLINA	78,100	66,500	1473.3	1,071.6	2,544.9
NORTH DAKOTA	20,000	-	458.4	-	458.4
OHIO	20,000	-	1099.4	96.0	1,195.4
OKLAHOMA	20,000	-	460.4	-	460.4
OREGON	52,400	440,500	2663.6	8,894.5	11,558.1
PENNSYLVANIA	88,000	-	1664.6	75.0	1,739.6
RHODE ISLAND	59,000	50,000	717.5	394.7	1,112.2
SOUTH CAROLINA	20,000	57,500	640.4	590.2	1,230.6
SOUTH DAKOTA	20,000	-	458.4	-	458.4
TENNESSEE	20,000	-	460.4	-	460.4
TEXAS	240,000	-	6149.0	-	6,149.0
UTAH	20,000	-	458.4	-	458.4
VERMONT	20,000	-	458.4	-	458.4
VIRGINIA	147,700	235,380	4493.3	2,178.9	6,672.2
WASHINGTON	141,100	516,500	3868.3	13,317.0	17,185.3
WEST VIRGINIA	20,000	-	458.4	-	458.4
WISCONSIN	20,000	-	480.4	429.0	909.4
WYOMING	20,000	-	458.4	-	458.4
AMERICAN SAMOA	152,400	-	2314.2	-	2,314.2
GUAM	20,000	-	458.4	-	458.4
PUERTO RICO	240,000	-	5407.0	-	5,407.0
VIRGIN ISLANDS	20,000	-	460.4	-	460.4
TTPI 1/	20,000	-	240.4	-	240.4
NO. MARIANAS	23,400	-	205.4	-	205.4
PMFC 2/	-	67,500	-	526.0	526.0
N.W. INDIAN TRB.	-	-	-	223.0	223.0
ASMFC 3/	-	42,000	-	254.0	254.0
NMFS NE Center	-	61,020 4/	-	-	-
TOTAL	4,000,000	$2,885,300 5/	102,979.7 6/	53,706.7	156,686.4 6/

1/ Trust Territory of the Pacific Islands
2/ Pacific Marine Fisheries Commission
3/ Atlantic States Marine Fisheries Commission
4/ Includes administrative costs and contracts for Striped Bass Stock Identification
5/ Includes Emergency Striped Bass Study Projects
6/ Includes 4(b) disaster assistance funds

CLASSIFICATION OF FEDERAL AND STATE FUNDS
BY ACTIVITY AND AUTHORIZATION
FISCAL YEAR 1987

Program activities cover various fields, including broad categories of research and development of commercial fisheries and conservation, development and enhancement of anadromous fishery resources. The majority of the funds, 86.2 percent, were used for research in such areas as the freshwater finfish, marine finfish, and shellfish and fisheries surveys; the remaining 13.8 percent, were used for collection of statistics; extension services; aquaculture, and other program activities. Funding figures shown include both State and Federal dollars for all 1987 project segments.

	Public Laws		Total	
ACTIVITY:	88-309 ($1,000)	89-304 ($1,000)	Dollars ($1,000)	Percent (Total)
Aquaculture	372.895.7	137.3	510.1	2.7
Construction	---	120.0	120.0	.6
Disease and parasite control	60.8	---	60.8	.3
Extension Service	449.7	---	449.7	2.3
Market Development	10.0	---	10.0	.1
Research				
Species Specific:				
Finfish (freshwater)	2,150.7	39.0	2,189.7	11.4
Finfish (marine or anadromous)	776.6	5,541.8	6,3218,4	32.9
Shellfish (includes Disaster assistance)	2,281.5	---	2,281.5	14.7
Gear Analysis	26.7	---	26.7	.1
Fisheries Surveys	5,485.1	---	5,485.1	28.5
Statistics	1,230.0	---	1,230.0	6.4
TOTAL:	$ 13,383.9	$ 5,838.1	$ 19,222.0	100.0%

PROJECT TITLES BY STATE AND PUBLIC LAW
WITH OTHER PERTINENT INFORMATION
FISCAL YEAR 1987

All 50 states, the Commonwealths of Puerto Rico and the Northern Mariana Islands, the Governments of American Samoa, Guam, the Virgin Islands, and the Trust Territory of the Pacific Islands, and certain Northwest Indian tribes are participating in the program under one or both authorizations. In FY 1987, 36 projects were completed at an estimated total cost (State and Federal dollars combined) of $9,921,902; 110 projects were initiated or are continuing at an estimated cost of $34,696,469. This includes 4 projects funded under the Disaster Assistance Program totalling $2 million. For all Public Law 88-309 projects completed or continued in FY 1987, the Federal share was 72 percent; the state share was 28 percent. For all Public Law 89-304 projects completed and continued the federal share was 58 percent; the state share was 42 percent. These percentages occurr because in many cases the state matching share is often more than is required by law. Instances where this occurred can be seen for both grant programs, Alaska in two programs matched 100% under Pub. L. 89-304, and Connecticut matched 100% on one Pub.L. 88-309 project. Similar instances occur which results in the Federal and state shares not being the absolute percentages as prescribed by the laws, but more of a minimum amount.

Tabulation of completed and continuing projects including total cost follows:

	Completed Projects		Continued Projects		Total Projects	
Public Law	#	$	#	$	#	$
88-309	28	7,650,602	76	14,792,195	104	22,442,797
89-304	8	2,271,300	34	19,904,274	42	22,175,574
TOTAL	36	$ 9,921,902	110	$34,696,469	146	$ 44,618,371

A list of continuing projects and those completed in 1987, under each authorization by State, including duration, date completed, and page reference for project narrative, is tabulated on pages **5** through **16.** Under Public Law 88-309, project numbers identify the Region administering the project by the first digit, project number sequence within the Region by next digit(s), followed by a letter to denote activity as R-research, C-construction, D-development, and S-coordination. Under Public Law 89-304, the first two letters, "AF" identify the project as anadromous fish, the next letter "C" indicates the projects are administered by NMFS, followed by a number sequence within each Region.

Public Law		Project number and title	Date initiated	Duration	Estimated Total Cost	Date Completed	Project Narrative
			Year	Years	Dollars	Year	Page
	ALABAMA						
88-309	2-421-R	Research and management of Alabama coastal fisheries	1985	3	F-304,200 S-101,400	1987	32
89-304 (Auburn University)	AFC-31	Nutrition studies for increasing production of striped bass fingerlings	1986	5	F- 82,700 S- 82,700		27
	ALASKA						
88-309	5-54-R	Southeast Alaska groundfish and herring resources	1986	5	F-208,100 S- 69,400		25
89-304	AFC-75	Anadromous salmon resource in Southeast Alaska	1986	5	F-2,377,000 S-2,377,000		25
	AFC-76	Chignik Sockeye Studies	1987	5	F-150,000 S-150,000		26
	AMERICAN SAMOA						
88-309	4-67-D	Deployment of FAD system in American Samoa	1984	4	F-95,000 S- 0	1987	18
	ARIZONA						
88-309	4-75-D	Fish disease and parasite training	1985	3	F-6,525 S-2,175		18
	4-76-D	Assessment of flathead catfish	1985	3	F-33,750 S-11,250		20
	4-85-D	Trout Food Diet Improvement	1987	1	F- 34,875 S- 11,625		21
	4-88-D	Commercial Fisheries Market Analysis	1987	1	F- 7,500 S- 2,500		19

Public Law	Project number and title		Date initiated	Duration	Estimated total cost	Date completed	Project narrative
			Year	Years	Dollars	Year	Page
	ARKANSAS						
88-309	2-432-R	Commercial fisheries survey	1986	3	F- 61,900 S- 20,633	1987	32
	ATLANTIC STATES MARINE FISHERIES COMMISSION						
89-304	AFC-2	Reevaluation of interstate striped bass conservation and management planning activities	1985	3	F-77,000 S-38,000		27
	AFC-3	Emergency striped bass study workshops	1985	3	F-37,000 S-0		27
	AFC-4	Research and analysis supporting interstate management of shad and river herring	1986	1	F-45,000 S-22,500	1987	24
	CALIFORNIA						
88-309	4-73-D	Fisheries monitoring and assessment, 85-87	1985	2	F-380,000 S-126,667	1987	35
	4-82-D	Marine Statistics Support Program	1987	2	F- 86,311 S- 142,864		35
	4-89-D	Assessment and Management of Commercial Fisheries	1987	1	F-167,327 S- 55,776		33
	4-90-D	Sacromento River Chinook Salmon Study	1987	2	F- 99,509 S- 33,170		26
	4-79-D	Southern California commercial fisheries assessment	1986	6	F-492,244 S-164,081		32
89-304	AFC-19	Salmon research and management	1986	1	F-407,000 S-407,000	1987	26
	AFC-20	Salmon research and management	1987	1	F-400,000 S-400,000		26
	COLORADO						
88-309	1-169-R	Warm-water fish culture	1983	5	F-102,800 S- 34,300		17
	1-189-R	Disease diagnosis for commercial fish farms	1987	1	F- 5,129 S- 1,170		18
	CONNECTICUT						
88-309	3-374-R	Connecticut lobster investigations	1982	6	F-122,161 S-122,161		29
89-304	AFC-15	Population dynamics studies of American shad in the CT River	1984	3	F-150,000 S-150,000	1987	24

Public Law	Project number	Project title	Date initiated	Duration	Estimated total cost	Date completed	Project narrative
			Year	Years	Dollars	Year	Page
	CONNECTICUT						
89-304	AFC-17	Population Dynamics studies of American shad in the Connecticut River.	1987	3	F-145,000 S-145,000		24
	DELAWARE						
88-309	3-358-D	Technical assistance to commercial fisheries	1982	6	F-219,400 S- 73,134		19
	3-411-D(4b)	Delaware oyster bed restoration	1987	1	F-160,000 S- 0		30
	FLORIDA						
88-309	2-405-D	Fisheries extension and marketing services program	1983	4	F-694,389 S-231,463	1987	19
	2-408-R	Florida's marine resources research, development and management program	1983	5	F-323,436 S-107,812	1987	33
	GEORGIA						
88-309	2-424-R	Studies and assessments of Georgia's marine fisheries resources	1986	3	F-160,267 S- 53,422	1987	33
89-304	AFC-29	Assessment and biotelemetry studies of Atlantic sturgeon in Georgia	1985	3	F- 57,960 S- 57,960		25
	GUAM						
88-309	4-58-D	Development of polyculture fish farming	1982	5	F- 99,400 S- 35,196	1987	17
	4-94-D	Development of polyculture fish farming	1987	1	F- 54,500 S- 30,444		17
	HAWAII						
88-309	4-77-D	Taape market development	1985	2	F-17,000 S-17,000	1987	20
	4-80-D	Upgrading Hawaii commercial fisheries information system	1986	1	F-58,007 S-19,336	1987	36
	4-91-D	Biochemical analysis of burnt tuna	1987	1	F- 14,500 S- 5,500		29
	4-92-D	Hawaii Small Scale Fishing Vessel Survey	1987	1	F-113,110 S- 37,708		36
	IDAHO						
88-309	1-186-R	Antisera production for identification of fish pathogens	1986	2	F-41,400 S-15,000		18

Public Law	Project number	Project title	Date initiated	Duration	Estimated total cost	Date completed	Project narrative
			Year	Years	Dollars	Year	Page
	ILLINOIS						
88-309	3-373-R	Effects of fleeting areas on mussel beds	1982	6	F- 82,931 S- 27,594		30
	3-427-R	A survey of the unionid mussel population of a known quality mussel bed of the Mississippi River	1988	1	F- 20,000 S - 6,667		30
	INDIANA						
88-309	3-387-R	Selected characteristics of the yellow perch stock in Indiana waters of Lake Michigan	1983	5	F-104,318 S- 87,327		21
	IOWA						
88-309	2-433-R	Spawning and Early Life history of paddlefish and shovelnose sturgeon	1987	1	F- 20,000 S- 6,667		20
	KANSAS						
88-309	2-430-R	Kansas marketable fisheries investigation	1986	3	F-50,700 S-16,900		36
	KENTUCKY						
88-309	2-429-R	Exploitation rates, movements & population size of commercial species at Kentucky Lake	1986	2	F-16,900 S- 5,633	1987	33
	2-437-R	Occurrence and Distribution of freshwater mussels species in Kentucky	1987	1	F- 20,000 S- 6,667	1987	30
	LOUISIANA						
88-309	2-412-R	Assessment & management of Louisiana's coastal fisheries	1984	3	F-753,500 S-251,167	1987	22
	2-436-R	Assessment & management of Louisiana's coastal fisheries	1987	3	F-240,000 S- 80,000	1987	22
	MAINE						
88-309	3-396-D	Collection of landings data and biological sampling of commercial fisheries	1984	4	F-66,752 S-66,754		36
	3-407-R	Lobster stock assessment	1985	3	F-369,500 S-369,500	1987	29
	3-410-R	Transboundary herring studies	1986	3	F-204,662 F-204,662		24

Public Law	Project number and title		Date initiated	Duration	Estimated total cost	Date completed	Project narrative
			Year	Years	Dollars	Year	Page
	3-426-R	Examination and ecology of potential nursery areas along coastal Maine for groundfish	1987	1	F- 30,395 S- 30,395		25
89-304	AFC-26	Kennebec River anadromous fish restoration and evaluation	1985	3	F-106,750 S-106,750		24
	AFC-27	Androscoggin River anadromous fish enhancement	1986	3	F-182,500 S-182,500		24
	MARYLAND						
88-309	3-413-D	Maryland fisheries statistics	1986	3	F-200,500 S-200,500		36
	3-419-R	Monitor shellfish disease and mortality in Chesapeake Bay.	1986	2	F-54,845 S-54,845		18
	3-422-D(4b)	Development of Chesapeake Bay oyster management strategy	1987	2	F-1,435,000 S- 0		31
89-304	AFC-15	Maryland striped bass investigation	1986	2	F-160,929 S- 78,229		27
	AFC-16	Mortality, growth and growth rate variability of striped bass and white perch in larvae in the Potomac River	1987	1	F- 50,000 S- 50,000		28
	MASSACHUSETTS						
88-309	3-404-D	Commercial fisheries technology and communications program	1985	3	F-321,530 S-177,241		19
	3-409-R	Massachusetts fishery resource assessment	1986	3	F-316,300 S-316,300		33
	3-416-D	Fisheries statistics and automated data processing	1986	3	F-212,110 S-255,005		36
89-304	AFC-21	Anadromous fisheries management	1986	5	F-215,000 S-215,000		18
	AFC-22	Hook and release mortality of striped bass (Emergency Striped Bass Research Study.	1987	1	F- 63,000 S- 7,000		28
	MICHIGAN						
88-309	3-384-R	Assessment of whitefish populations in the treaty area of Lake Michigan	1983	5	F-105,500 S- 41,900		21

Public Law	Project number and title		Date initiated	Duration	Estimated total cost	Date completed	Project narrative
			Year	Years	Dollars	Year	Page
89-304	AFC-15	Evaluation of anadromous fish gilling mortality in trap nets	1984	3	F- 60,000 S- 60,000	1987	32
	MINNESOTA						
88-309	3-393-R	Lake Superior commercial fisheries assessment studies	1984	4	F-69,725 S-29,375		33
	MISSISSIPPI						
88-309	2-415-R	Experimental evaluation of sodium ricinoleate as an agent for the prevention of blue-green algal blooms & their off-flavor in commercial catfish ponds	1984	3	F-200,985 S- 66,995	1987	17
	2-422-R	Mississippi Gulf Coast fisheries monitoring and assessment program	1985	3	F-420,000 S-140,000	1987	34
	2-435-R	Evaluation of methods to depurate oysters (Crassostrea virginica)	1987	1	F-101,695 S- 33,898		31
89-304	AFC-30	Mississippi and Alabama cooperative striped bass restoration program	1986	3	F-91,500 S-45,750		17
	MISSOURI						
88-309	2-416-R	Research and management of Missouri's commercial fisheries resource	1984	5	F-150,000 S- 50,000	1987	22
	MONTANA						
88-309	1-162-R	Development and management of commercial fishing practices	1982	6	F-122,900 S- 37,400		22
	NEBRASKA						
88-309	2-402-R	Nebraska commercial fishery investigations	1983	5	F-112,382 S- 37,461		36
	NEVADA						
88-309	4-74-D	Aquaculture in geothermal water	1985	3	F- 27,500 S- 9,167		17
	4-93-D	Assessment in Lake Mead	1987	1	F- 40,002 S- 13,334		29

Public Law	Project number	Project title	Date initiated	Duration	Estimated total cost	Date completed	Project narrative
			Year	Years	Dollars	Year	Page
	NEW HAMPSHIRE						
88-309	3-414-D	Improvement of American oyster (Crassostrea virginica) beds in the Great Bay estuary	1986	2	F- 46,600 S- 15,534		31
89-304	AFC-7	Distribution and abundance of shortnose sturgeon(Acipenser brevirostrum) in the Great Bay estuary and coastal New Hampshire waters	1987	1	F- 9,000 S- 9,000		27
	AFC-8	The timing of juvenile river herring downstream migration	1987	1	F- 27,300 S 27,300		23
	NEW JERSEY						
88-309	3-405-R	Inventory of New Jersey's estuarine shellfish resources	1985	5	F-303,910 S-303,910		34
	3-415-D	Marine fishermen's coordination project	1986	3	F- 40,200 S- 13,400		19
	3-424-D(4b)	Emergency oyster seed bed revitalization project	1987	1	F-202,500 S- 0		31
89-304	AFC-10	Anadromous herring run restoration	1986	1	F- 25,000 S- 25,000	1987	23
	AFC-11	Anadromous herring run restoration	1987	1	F- 12,500 S- 12,500		23
	NEW MEXICO						
88-309	2-431-R	Impacts of commercial fish harvest	1986	3	F-53,093 S-17,698		37
	NEW YORK						
88-309	3-403-D	Sanitary examination of shellfish lands	1985	2	F-172,665 S-172,665	1987	34
	3-425-R	American lobster investigation in New York waters	1987	1	F- 71,500 S- 71,500		30
89-304	AFC-13	A study of the striped bass in the Marine District of New York State V	1985	3	F-418,400 S-101,636		28
	NORTH CAROLINA						
88-309	2-419-R	North Carolina commercial finfish assessment	1985	3	F-250,000 S- 83,333		34

Public Law	Project number and title		Date initiated	Duration	Estimated total cost	Date completed	Project narrative
			Year	Years	Dollars	Year	Page
88-309	2-439-R	Evaluation of certified trawl efficiency devices (TEDs) in North Carolina nearshore ocean	1987	1	F- 20,000 S- 6,667		32
89-304	AFC-27	North Carolina alosid management project	1985	3	F-125,000 S-125,000		23
	NORTHERN MARIANAS						
88-309	4-78-D	Marianas data collection 86-87	1986	1	F-22,500 S- 6,000	1987	37
	OHIO						
88-309	3-379-R	Ecology of yellow perch in Lake Erie	1983	5	F-217,800 S- 72,601		22
	OKLAHOMA						
88-309	2-410-R	Oklahoma commercial fisheries program	1984	5	F- 84,740 S- 28,246		23
	OREGON						
88-309	1-174-R	Squid resource assessment	1984	4	F-158,400 S- 52,800		32
	1-185-R	Groundfish stock assessment; discard study	1986	2	F- 71,600 S- 23,900		25
89-304	AFC-127	Research and development of Oregon's coastal salmon stocks	1984	5	F-891,900 S-891,900		26
	AFC-130	Joint Oregon-Washington multijurisdictional salmon management program	1984	5	F-1,700,500 S- 850,200		26
	PACIFIC MARINE FISHERIES COMMISSION						
89-304	AFC-126	Regional mark processing center	1984	5	F-319,400 S-159,700		26
	PENNSYLVANIA						
88-309	3-397-R	Assessment of yellow perch in Pennsylvania waters of Lake Erie	1985	5	F-432,951 S-144,317		22
	PUERTO RICO						
88-309	2-428-R	Puerto Rico commercial fisheries research and development program	1986	5	F- 448,000 S- 161,335		34

Public Law	Project number and title		Date initiated	Duration	Estimated total cost	Date completed	Project narrative
			Year	Years	Dollars	Year	Page
	RHODE ISLAND						
88-309	3-400-R	Examination of bay scallop (Argopecten irradians) reproductive cycles	1984	3	F-90,000 S-90,000	1987	31
	3-408-R	Coastal fishery resource assessment	1986	3	F-90,900 S-30,300		34
89-304	AFC-4	Striped bass stock assessment in Rhode Island waters (Emergency Striped Bass Research Study)	1981	7	F-250,500 S- 58,943		28
	SOUTH CAROLINA						
88-309	2-426-D	Development of subtidal hard clam population in coastal South Carolina	1986	1	F-30,147 S-10,049	1987	29
	2-434-R	Assessing natural recruitment and juvenile survival of clams in natural and artificial clam populations	1987	1	F- 20,000 S- 6,667		29
89-304	AFC-32	Investigations on commercial anadromous species in South Carolina	1987	2	F-239,000 S-239,000		23
	SOUTH DAKOTA						
88-309	1-173-R	Abundance and distribution of rainbow smelt in Oahe Reservoir	1983	5	F-113,100 S- 58,800		20
	TENNESSEE						
88-309	2-420-R	Commercial mussel resource management	1985	2	F- 42,500 S- 14,167	1987	30
	2-438-R	Commercial mussel resource management	1987	2	F- 40,000 S- 13,334		30
	TEXAS						
88-309	2-427-R	Texas commercial fisheries management program	1986	5	F-484,000 S-161,333		35
89-304	AFC-33	Study of Historical striped bass populations in Texas waters.	1987	1	F- 3,000 S- 3,000		28

Public Law	Project number	Project title	Date initiated	Duration	Estimated total cost	Date completed	Project narrative
			Year	Years	Dollars	Year	Page
	TRUST TERRITORY OF THE PACIFIC ISLANDS						
88-309	4-69-D	Regional standardization of catch data	1984	3	F- 55,100 S- 13,367	1987	37
	4-81-D	Palau reef fish subsistence catch	1986	2	F- 25,163 S- 8,388		37
	4-84-D	Marshall Islands fishery statistics	1987	1	F- 21,633 S- 9,700		37
	4-95-D	Regional standardization of catch Data II	1987	1	F- 54,500 S- 10,333		37
	UTAH						
88-309	1-182-R	Inspection and disease certification of commercial fish hatcheries	1984	4	F-76,400 S-25,500		18
	VERMONT						
88-309	3-420-R	Assessment of the winter smelt fishery on Lake Champlain	1987	2	F-42,039 S-14,013		21
	3-429-R	Assessment of the winter yellow perch fishery in the Northeast Arm of Lake Champlain	1987	1	F- 21,800 S- 7,267		22
89-304	AFC-1	Stock identification of rainbow smelt from Lake Champlain	1987	1	F- 19,500 S- 19,500		21
	VIRGIN ISLANDS						
88-309	2-411-R	Virgin Islands commercial fisheries research & development project	1984	5	F- 82,900 S- 27,633		35
	VIRGINIA						
88-309	3-361-D	Fisheries resource statistics and information systems	1982	5	F-579,300 S-193,099	1987	37
	3-417-D	Commercial fisheries statistics information systems	1987	1	F-130,700 S- 43,567	1987	37
	3-421-R	The assessment of commercial fishing effort in Virginia	1986	1	F- 26,600 S- 8,868	1987	38
	3-423-D(4b)	Restoration of Virginia's oyster resources	1988	1	F-202,500 S- 0		31

Public Law	Project number	Project number and title	Date initiated	Duration	Estimated total cost	Date completed	Project narrative
			Year	Years	Dollars	Year	Page
88-309	3-428-D	Fisheries resource statistics and information systems	1988	1	F-147,700 S- 49,233		38
89-304	AFC-13	Study of Alosa stock composition and year class strength in Virginia	1984	3	F-236,700 S-236,700	1987	23
	AFC-18	Striped bass research in Virginia	1986	2	F-239,568 S- 79,749		28
	AFC-19	A mark recapture study of striped bass in the James River, VA (Emergency Striped Bass Research Study)	1987	3	F-265,000 S- 66,250		28
	AFC-20	Study of Alosa stock compostion and year strength in Virginia	1987	3	F-223,000 S-223,000		24
	WASHINGTON						
88-309	1-167-R	Coastal Dungeness crab project	1983	5	F-135,200 S- 44,500		29
	1-168-R	South coast marine fish/ shellfish monitoring	1983	5	F-114,000 S- 38,000		35
	1-170-R	Marine fish management and stock assessment	1983	5	F-305,900 S-102,000		35
	1-183-R	Coastal pink shrimp management and investigations	1985	3	F-88,700 S-29,600		32
	1-184-R	Central coast groundfish monitoring	1985	3	F-60,200 S-20,100		25
89-304	AFC-128	Joint Washington-Oregon multijurisdictional salmon management program	1984	5	F-2,774,500 S-1,387,300		27
	AFC-129	Quantitative analysis support	1984	3	F-62,200 S-62,200	1987	35
	WEST VIRGINIA						
88-309	3-372-R	Commercial fishery investigations	1982	5	F-33,750 S-11,250	1987	38
	3-418-D	Development of an Ohio River commercial fisheries atlas	1987	2	F-38,150 S-19,204		20
	WISCONSIN						
88-309	3-382-R	Management of a quota controlled commercial chub fishery	1983	5	F-103,500 S- 34,500		35

Public Law	Project number and title		Date initiated	Duration	Estimated total cost	Date completed	Project narrative
			Year	Years	Dollars	Year	Page
89-304	AFC-16	Assess walleye populations in Green Bay, Lake Michigan	1983	4	F-161,000 S-161,000	1987	21
	WYOMING						
88-309	1-172-R	Commercial fishery development extension services	1983	5	F- 56,000 S- 19,500		19
	1-187-R	Evaluation of the bait-fish industry	1986	1	F- 23,400 S- 7,800	1987	20
	1-188-R	Channel catfish spawning assessment	1987	1	F- 23,500 S- 9,165		20

PROGRAM ANALYSIS

For program analysis, projects are grouped under the type of activity undertaken rather than by State or Public Law. In doing so, the reader has all projects for the 1987 segment of the program, such as construction, coordination, or research,in one section.

Included under each type of activity are project identification, principal investigator,and 1987 project segment cost, State and Federal. If projects were continued or completed in 1987 with prior year funds, no cost is indicated below.

Requests for additional information, about a project or for reprints of reports resulting from the work, should be made to the appropriate NMFS Regional Office, State agency, or Cooperator. The Regional Offices, State agencies, and Cooperators, including addresses are listed starting on page 46.

AQUACULTURE

Colorado 1-169-R — Stephen A. Flickinger — F- 14,870 S- 4,957

Warm water fish culture - Asses the feasibility of and potential for cage culture of channel catfish in Colorado reservoirs.

Guam 4-58-D — Harry Kami — COMPLETED 1987

Development of polyculture fish farming - Increase efficiency and expand production of local aquaculture farms.

Mississippi 2-415-R — Richard Leard — F- 200,985 S- 66,995

Sodium ricinoleate evaluations - Experimental evaluation of Sodium Ricinoleate as an Agent for the prevention of blue-green algal blooms and their off-flavor in commercial catfish ponds.

Mississippi AFC-30 — Larry C. Nicholson — F- 91,500 S- 45,750

Mississippi/Alabama cooperative striped bass restoration program - Restore the striped bass population in the Gulf of Mexico Coastal area of the states of Alabama and Mississippi by annual stocking of advanced striped bass fingerlings.

Nevada 4-74-D — Robert L. Taylor — F- 0 S- 0

Aquaculture in Geothermal Water - Determine the feasibility of culturing aquatic species in geothermal water sources, primarily channel catfish and freshwater prawns.

Guam 4-94-D — Harry Kami — F- 54,500 S- 30,444

Development of polyculture fish farming - Artificial propagation of Thai catfish.

CONSTRUCTION

Fisheries Development and Enhancement

American Samoa 4-67-D — Henry Sesepasara — COMPLETED 1987

Deployment of FAD system in American Samoa - Construction and deployment of nine fishery aggregation devices.

Massachusetts AFC-21 — Joseph DiCarlo — F- 60,000 S- 60,000

Anadromous fisheries management - A program which maintains and enhances existing populations, restores historically important populations and establishes new populations of anadromous fish, through transplants and construction of fish passage facilities. Emphasis will also be given to biological evaluation of restoration efforts and a survey of Atlantic and shortnose sturgeon populations in the Merrimack River.

DISEASE AND PARASITE CONTROL

Arizona 4-75-D — Warner B. Poppleton — F- 0 S- 0

Fish disease and parasite training - Provides training of laboratory biologist providing diagnostic and certification services to statewide aquaculture and fish import interests.

Colorado 1-189-R — Pete Walker — F- 5,129 S- 1,170

Disease diagnosis for commercial fish farms in Colorado- Collect and analyze water samples for disease from commercial fish farms and feral spawn-taking waters in Colorado.

Idaho 1-186-R — Vern Winston, A. Kent Hauck — F- 20,000 S- 7,845

Antisera production for the identification of fish pathogens- Develop neutralizing antibody against the IPN virus in Idaho.

Maryland 3-419-R — George E. Krantz — F- 0 S- 0

Monitor shellfish disease and mortality in Chesapeake Bay- Determine the geographical distribution and intensity of infection for shellfish diseases, particularly those for oysters. Collect and examine suspect shellfish for presence of disease and make recommendations which would facilitate the production of seed and growth of oysters in areas that offer the least risk.

Utah 1-182-R — Ronald Goede — F- 20,000 S- 6,667

Inspection and disease certification of commercial fish hatcheries - Inspect commercial trout hatcheries, monitor ovarian fluid for viral pathogens during egg-taking operations, and develop pathogen elimination program.

EXTENSION SERVICE

Delaware 3-358-D — Richard Cole — F- 36,000 S- 12,000

Technical assistance to commercial fisheries - Provide technical assistance to commercial fishermen, seafood industries, and government authorities on management, enforcement, and dissemination of data to improve management and economics of Delaware's commercial fisheries industries.

Florida 2-405-D — Charles C. Thomas — F- 157,149 S- 52,383

Create and develop educational materials for use in training - Create a greater demand for seafood. Enhance public image of mullet, Spanish mackerel, rock shrimp, shark, croaker, squid, dolphin, etc., introduce and encourage the purchase of same. Provide industry with technical assistance and market development. Increase economic impact to State by increasing new markets throughout the United States.

Massachusetts 3-404-D — Buell Hollister, H. Arnold Carr — F- 124,619 S- 67,103

Commercial fisheries technology and communications program - Implement a consolidated approach to provide services to the commercial fishing and seafood industries by keeping the industrial sectors aware of fisheries management considerations/strategies, assessing the reaction or concerns of industry and the public, and collecting detailed data to better acquaint managers of potential problems. Particular emphasis is given to study on gear selectivity and impact as well as to increasing the public's awareness of quality regional fish products.

New Jersey 3-415-D — John Makai — F- 9,000 S- 3,000

Marine fishermen's coordination project - Provide communications pathway between New Jersey commercial fishermen, processors, dealers and New Jersey fisheries management agencies, which addresses current concerns and needs of the commercial fishing industry.

Wyoming 1-172-R — Wayne Hubert — F- 36,000 S- 12,800

Commercial fisheries development extension services - Assess the potential for a limited access channel catfish fishery in the Powder River Drainage, Wyoming.

MARKET DEVELOPMENT

Arizona 4-88-D — Joseph L. Janisch — F- 7,500 S- 2,500

Commercial fisheries market analysis - Determine marketability and demand for commercially produced and harvested fish in southwestern markets.

Hawaii 4-77-D — Alvin Katekaru — COMPLETED 1987

Taape market development - Determine potential market for taape (Lutjanus kasmira) in Hawaii, a common under-utilized bottomfish.

FINFISH:

Freshwater:

Baitfish

Wyoming	1-187-R	Stanley Anderson Lynn Noel	COMPLETED 1987

Evaluation of the baitfish industry in Wyoming - Collect information on the species of bait-fish harvested in Wyoming and the utilization and value of the fish harvested.

Catfish

Arizona	4-76-D	Warner B. Poppleton	F- 0 S- 0

Assessment of Flathead Catfish - Assesses the standing stocks of flathead catfish in the lower Colorado, Gila, Salt, and Verde Rivers and determine effects of commercial fishing.

West Virginia	3-418-D	Larry A. Nielsen	F- 20,750 S- 10,375

Development of an Ohio River commercial fisheries atlas - Compile, through an intensive cooperative venture, all available data pertaining to the commercial fisheries for West Virginia waters of the Ohio River. Information collected will be summarized by development of an atlas (habitat maps) and through critical assessment of environmental and fisheries management concerns.

Wyoming	1-188-R	Wayne Hubert	F- 23,500 S- 9,165

Channel catfish spawning assessment - Assess timing and magnitude of movement associated with spawning by adult channel catfish and define possible spawning sites and habitat conditions in the Powder River Drainage.

Paddlefish

Iowa	2-433-R	Dennis L. Scarnecchia John S. Ramsey	F- 20,000 S- 6,667

Spawning and early life history of paddlefish and shovelnose sturgeon -Determine habitats and other physical factors required by paddlefish and shovelnose sturgeon to achieve successful reproduction and habitat association.

Rainbow smelt

South Dakota	1-173-R	Gary Marrone Cliff Stone	F- 20,000 S- 12,300

Abundance and distribution of rainbow smelt in Oahe Reservoir- Obtain baseline data and develop management methodology using hydroacoustical sampling methods.

Vermont 420-R	George W. LaBar	F-	16,203
		S-	5,401

Assessment of the winter smelt fishery on Lake Champlain - Determine the magnitude and character of the commercial winter smelt fishery on Lake Champlain. Data gathered will include retail information, as well as catch rate, age, growth and sex parameters of rainbow smelt (Osmerus mordax). Results will be used to help evaluate the effectiveness of the Strategic Plan for Development of Salmonid Fisheries in Lake Champlain.

Vermont AFC-1	George W. LaBar	F-	19,500
		S-	19,500

Stock identification of rainbow smelt from Lake Champlain- Analyze meristic and morphometric characteristics to determine if Lake Champlain's rainbow smelt populations constitute one or several stocks. Genetic differentiation studies will also be conducted on selected muscle tissue samples to determine stock coherency.

Trout

Arizona 4-85-D	Joseph L. Janisch	F-	34,875
		S-	11,625

Trout food diet development - Development of a more effective diet for trout raised in 68 degree F. water.

Walleye

Wisconsin AFC-16	Lee Kernen	COMPLETED 1987

Assess walleye populations in Green Bay, Lake Michigan- Maintain, through a stocking and assessment program, an adult walleye standing stock of at least four per acre in Green Bay, while providing a sustained commercial harvest of 10,000 pounds or more annually in Lake Michigan.

Whitefish

Michigan 3-384-R	R.W. Rybicki	F-	23,500
		S-	7,900

Assessment of whitefish populations in the treaty area of Lake Michigan - Monitor whitefish harvest in the commercial trapnet fishery, determine relative abundance of pre-recruits, and forecast the total allowable yield of whitefish in the treaty waters of Lake Michigan.

Yellow perch

Indiana 3-387-R	Thomas S. McComish	F-	20,000
		S-	11,898

Selected characteristics of the yellow perch stock in Indiana waters of Lake Michigan - Determine abundance, age and growth, size at sexual maturity, food habits, and fecundity of yellow perch in Indiana waters of Lake Michigan.

Ohio 3-379-R Bruce Vondracek F- 23,500
S- 7,834

Ecology of yellow perch in Lake Erie - Determine whether management models for yellow perch in Lake Erie can be improved by examining the relative importance of food availability and temperature as factors causing differences in growth rates between western and central basin populations.

Pennsylvania 3-397-R R. B. Kenyon F- 142,759
S- 47,286

Assessment of yellow perch in Pennsylvania waters of Lake Erie - Predict numbers of yellow perch annually recruiting to the Lake Erie fishery and estimate optimum fishing mortality/corresponding yield per recruit to enable determination of appropriate management strategies.

Vermont 3-429-R George W. LaBar F- 20,861
S- 6,954

Assessment of the winter yellow perch fishery in the Northeast Arm of Lake Champlain - Determine through creel census and biological sampling, the size, age, structure, growth rates and sex ratio of yellow perch in the Northeast Arm of Lake Champlain. In addition, assess the commercial fishing effort and monitor the magnitude of harvest and quantity of sale in local markets.

Others

Louisiana 2-412-R Claude Boudreaux F- 753,500
S- 251,167

Assessment and management of Louisiana's coastal fisheries - To maintain a coastwise program which monitors relevant parameters of economically important seafood resources.

Louisiana 2-436-R Claude Boudreaux F- 240,000
S- 80,000

Assessment and management of Louisiana's coastal fisheries - to maintain a coastwise program which monitors relevant parameters of economically important seafood resources.

Missouri 2-416-R Timothy P. Grace F- 150,000
S- 50,000

Research and management of Missouri's commercial fisheries resources - To determine the number of commercial fishermen, pounds of fish harvested and the wholesale value of Missouri's river commercial fisheries; by gear type, county, and by river open to commercial fishing. Determine live-weight wholesale value.

Montana 1-162-R William Wiedenheft F- 20,000
S- 6,666

Development and management of commercial fishing practices - Assess the commercial and sportfish species in Fort Peck reservoir.

Oklahoma	2-410-R	Mark Ambler Hutchie Weeks	F- 84,740 S- 28,246

Oklahoma commercial fisheries program - To monitor selected fish populations in lakes undergoing commercial harvest in Oklahoma and collect and analyze commercial fishery harvest results.

Marine or Anadromous:

American Shad and River Herring

New Hampshire	AFC-8	Robert S. Fawcett	F- 27,300 S- 27,300

The timing of juvenile river herring downstream migration- Determine the timing of juvenile river herring downstream migration through selected New Hampshire waters. Juvenile fish will be sampled utilizing a variety of nets to determine both their size and location when migration does occur. Information obtained will aid in protecting and managing this resource effectively.

New Jersey	AFC-10	Donald Byrne	COMPLETED 1987

Anadromous herring run restoration - Identify and evaluate New Jersey coastal watersheds on the basis of potential for enhancement and/or restoration of anadromous clupeid populations.

New Jersey	AFC-11	Donald Byrne	F- 12,500 S- 12,500

Anadromous herring run restoration project - Identify and evaluate New Jersey coastal watersheds on the basis of potential enhancement/restoration of anadromous clupeid populations.

North Carolina	AFC-27	Michael W. Street	F- 125,000 S- 125,000

North Carolina Alosid management project - Determine relative abundance, growth, and distribution of juvenile alosid species. Estimate the annual commercial harvest and value of anadromous fishes in Albemarle Sound Area.

South Carolina	AFC-32	Glenn Ulrich	F- 239,000 S- 239,000

Investigations of Commercial Anadromous Species in South Carolina - Sample catch/effort of shad fishery. Conduct ocean tagging of American shad for stock identification. Monitor incidental catch of Atlantic and shortnose sturgeon by commercial shad fishermen.

Virginia	AFC-13	Joseph G. Loesch	COMPLETED 1987

Study of Alosa stock composition and year class strength in Virginia - Collect harvest and biological data for analysis of alosid (alewife, American shad, and blueback herring) populations in Virginia coastal waters and evaluate annual relative abundance, growth, and mortality of juvenile Alosa stocks. Study results will contribute to the data base essential for the development of an interjurisdictional (multi-state) management plan for these fisheries.

Virginia AFC-20 Joseph G. Loesch F- 65,000
S- 65,000

A study of **Alosa** stock composition and year class strength in Virginia - Collect harvest and biological data for analysis of alosid (alewife, American shad and blueback herring) populations in Virginia coastal waters and evaluate annual relative abundance, growth, and mortality of juvenile alosid stocks.

ASMFC AFC-4 Paul Perra COMPLETED 1987
(Atlantic States Marine Fisheries Commission)

Research and analysis supporting interstate management of shad and river herring - Identify and assess research needs relative to the protection and restoration of anadromous alosids along the Atlantic seaboard. Due to the migratory nature of these species, study results will be jointly evaluated to promote an active interchange of ongoing research among the concerned state fisheries agencies. This exchange of information is essential in effectively monitoring the Interstate Fishery Management Plan for American Shad and River Herrings.

Connecticut AFC-15 Thomas Savoy COMPLETED 1987

Population dynamics studies of American shad in the Connecticut River - Monitor annual fluctuations in shad population size and commercial fishing mortality to appraise the current stock status, understand the causes of long-term population trends, and corroborate or modify current lines of research.

Connecticut AFC-17 Thomas Savoy F- 45,000
S- 45,000

Population dynamics studies of American shad in Connecticut. To monitor and evaluate, through field sampling, relative abundance/fluctuations in shad population size. To monitor both the sport and commercial shad harvest in the Connecticut and Thames Rivers. Results will directly contribute to research and information needs identified in the Interstate Fishery Management Plan for this species.

Maine AFC-26 Thomas S. Squiers, Jr. F- 25,000
S- 25,000

Kennebec River anadromous fish restoration and evaluation - Determine abundance indices for juvenile alosids (American shad and alewives); reestablish a resident striped bass spawning population to the estuarial complex, and refine/expand an Anadromous Fish Restoration Plan for the Kennebec River.

Maine AFC-27 Lewis N. Flagg F- 44,400
S- 44,400

Androscoggin River anadromous fish enhancement - Restore anadromous runs of American shad and other alosids to the Androscoggin River. Determine the timing, magnitude, sex composition, and year class strength of alosid populations, with particular emphasis placed on juvenile alewives.

Maine 410-R Stanley B. Chenowith F- 102,230
S- 102,230

Transboundary herring studies - To assess the importance of Eastern Maine and Southwestern New Brunswick spawning sites by

tracking the dispersal of Atlantic herring through both the juvenile and adult stages between Canadian and United States waters. Study results will enable the State to effectively address transboundary management concerns for this species.

Atlantic Sturgeon:

Georgia	AFC-29	Susan Shipman	F- 57,960 S- 57,960

Assessment and biotelemetry studies of Atlantic sturgeon in Georgia - Determine the population structure of the commercial sturgeon fishery including age date, sex ratios, length frequencies and size at maturity. Conduct a biotelemetry study on Atlantic sturgeon to determine movement and migration patterns. Determine spawning migration, residence times, daily and seasonal movements.

Groundfish:

Alaska	5-54-R	Barry Bracken Dennis Blackenbeckler	F- 208,100 S- 69,000

Southeast Alaska Groundfish and Herring Research - Determine domestic groundfish landings in the Eastern Regulatory Area of the Gulf of Alaska; refine hydroacoustical equipment to make reliable herring biomass estimates.

Maine	3-426-R	Richard W. Langton	F- 30,395 S- 30,395

Examination and ecology of potential nursery areas along coastal Maine for groundfish - A program designed to evaluate the production from a coastal nursery area, and to assess how environmental variables affect survival of groundfish species from time of hatching until recruitment to the fishery. To determine the occurrence and distribution of selected groundfish species in Sheepscot Bay and environs with emphasis on juveniles through a trawl sampling design. Information collected will focus on fish community structure, food habits and predator/prey relationships.

Oregon	1-185-R	Robert Demory	F- 33,617 S- 11,205

Groundfish stock assessment; Discard study - Determine species composition of groundfish caught by trawl, determine size and age composition of discarded sole and sablefish and use this information to correct catch at age estimates used in cohort analysis.

Washington	1-184-R	Brian Culver	F- 27,574 S- 9,192

Central coast groundfish monitoring - Monitor commercial and recreational landings of groundfish and obtain biological information needed for effective management.

Salmon

Alaska	AFC-75	Alan Davis Ben Van Allen Fred Bergander Leon Shaul Doug Jones	F- 475,500 S- 475,500

Anadromous Salmon Research in Southeast Alaska - Index abundance

of salmon populations returning to river systems to provide commercial fishery managers information for managing harvests; obtain information on migration routes, run timing, relative abundance, and contribution of key salmon stocks.

Alaska	AFC-76	Donald E. Rogers	F- 32,000 S- 33,114

Chignik sockeye studies - Monitor and determine the importance and dynamics of late season runs of sockeye and coho salmon that return to Chignik Lake on the Alaska Peninsula. Investigate the feasibility of maintaining the weir on Chignik River through mid-September to calibrate methods for estimating late season escapement.

California	AFC-19	L.B. Boydstun	COMPLETED 1987

Salmon Research and Management - Ocean salmon port sampling. Assessment of Klamath River salmon and steelhead returns and harvest. Determine size, composition, distribution and timing of adult salmon runs in the Trinity River. Determine if sonar can be used to count salmon accurately in the Klamath River.

California	AFC-20	L.B. Boydston Paul M. Hubbell	F- 400,000 S- 400,000

Salmon research and management - Ocean salmon monitoring and assessment of salmon resources in the KLamath River.

California	4-90-D	Richard Painter Bill Snider	F- 99,509 S- 33,170

Sacramento River chinook study - Assessment of Sacramento River chinook salmon runs.

Oregon	AFC-127	Emery Wagner	F- 165,811 S- 165,811

Research and development of Oregon's coastal salmon stocks - Conduct investigations on hatchery and wild stocks of chinook and coho in selected Oregon estuaries and rivers.

Oregon	AFC-130	Malcolm Zirges	F- 254,689 S- 127,344

Joint Oregon-Washington multijurisdictional salmon management program - Monitor the commercial and recreational ocean salmon fisheries in Oregon; apply, recover and decode coded wire tags; and assess stock abundance and distribution.

PMFC	AFC-126	J. Kenneth Johnson	F- 67,500 S- 33,750

Regional Mark Processing Center - Operated the Regional Mark Processing Center for identification of coded-wire tagged salmon stocks released and recovered in all west coast and Alaska fisheries.

Washington	AFC-128	Richard Lincoln Lee Blankenship Bonnie Ponwith	F- 532,500 S- 266,250

Joint Washington-Oregon multijurisdictional salmon management

program - Monitor the commercial and recreational ocean salmon fisheries in Washington; apply, recover and decode coded wire tags; and assess stock abundance and distribution.

Shortnose sturgeon:

New Hampshire AFC-7	John I. Nelson	F- 9,000 S- 9,000

Distribution and abundance of shortnose sturgeon (**Acipenser brevirostrum**) in the Great Bay Estuary and coastal New Hampshire waters - To determine the distribution and abundance of shortnose sturgeon in the Great Bay estuary and coastal New Hampshire waters. Information gathered will enable a better understanding of the sturgeon's habitat requirements and foster state-federal efforts to assess the status of this endangered species.

Striped Bass:

Alabama AFC-31 (Auburn Univ.)	R. T. Lovell	F- 82,700 S- 82,700

Nutrition studies for increasing production of striped bass fingerlings - Extract and identify the factor(s) in brine shrimp nauplii responsible for growth of striped bass larvae.

ASMFC AFC-2 (Atlantic States Marine Fisheries Commission)	Paul Perra	F- 35,000 S- 17,500

Reevaluation of interstate striped bass conservation & management planning activities - Reassess the goals and objectives pertaining to cooperative, interstate management of striped bass and revise the existing Interstate Fisheries Management Plan as may be necessary to address developments in the resource and fishery over the past six years. In this process, project will synthesize research information into a form that will delineate management options appropriate for joint state implementation.

ASMFC AFC-3	Paul Perra	F- 7,000 S- 0

Emergency striped bass study workshops - Organize, conduct, and prepare draft proceedings for two striped bass workshops, the purpose of which is to present and address the findings of striped bass investigations as well as to provide state fishery managers with current scientific data so that joint management measures for this species may be effectively implemented.

Maryland AFC-15	Steve Early	F- 50,000 S- 5,556

Maryland striped bass investigations - Characterize the age, size and sex composition of striped bass in spawning areas and during the fall/early winter period in Chesapeake Bay. Implement a tagging program which provides information on migration, mortality and contributions to coastal migratory stocks. Tag return information will aid in current restoration efforts required under the Interstate Fisheries Management Plan for this species.

Maryland AFC-16	Edward D. Houde	F - 50,000 S - 5,556

Mortality, growth and growth rate variability of striped bass and white perch larvae in the Potomac River, Md - To age striped bass

and white perch larvae using otolith aging techniques, estimate growth and mortality rates of larvae and define relationships between larval abundance and environmental conditions. To produce a predictive model which will compare habitat variability to the potential for year class success and provide the means to predict or forecast future year class strengths.

New York AFC-13 Byron Young F- 101,000
S- 11,236

A study of the striped bass in the marine district of New York State V - Continue collection of bio-characteristics data of New York's striped bass population through sampling of coastal commercial and recreational catch, and assess striped bass spawning success in the Hudson River to provide indices of year-class strength.

Massachusetts AFC-22 Paul Diodati F- 63,000
S- 7,000

Hook and release mortality of striped bass - To evaluate through field activities hook/release mortality rates of striped bass. Attempt to assess which variety of factors influence the probability of survival of fish captured by hook and line and subsequently released. These factors will include; environmental data, individual fish characteristics, gear type, and landing/handling techniques.

Rhode Island AFC-4 John F. O'Brien F- 50,000
S- 5,555

Striped bass stock assessment in Rhode Island waters- Characterize the composition of Rhode Island striped bass commercial landings to help assess the current status of coastal stocks and determine the level of exploitation by various fisheries.

Texas AFC-33 Gary Matlock F- 3,000
S- 3,000

Historical Striped Bass Distribution - Determine the historical distribution of striped bass in Texas and formulate a strategy for their restoration and management.

Virginia AFC-18 Joseph G. Loesch F- 120,000
S- 40,000

Striped bass research in Virginia - Monitor the abundance of young-of-the-year striped bass in selected river systems and examine relationships between juvenile abundance and environmental variables. These data will augment existing data from previous surveys and contribute to interstate fisheries management

---

Virginia AFC-19 Joseph G. Loesch F- 50,380
S- 21,500

A mark-recapture study of striped bass in the James River, Virginia - To tag and release striped bass in the James River to evaluate migratory behavior and exploitation rates in coastal fisheries.

Tuna:

Hawaii 4-91-D — David Grobecker, Peter Hochachka — F- 14,500, S- 5,500

Biochemical analysis of burnt tuna - Determine if calcium activated proteases are the underlying causes of burnt tuna.

SHELLFISH:

Clams

South Carolina 2-426-D — Bill Anderson — F- 30,147, S- 10,049

Development of subtidal hard clam populations in coastal SC - Establish subtidal clam populations. Locate commercial sources of seed oysters. Locate hard clam brood stock populations. Initiate a physical evaluation of the subtidal hard clam habitat.

South Carolina 2-434-R — David Cupka — F- 20,000, S- 6,667

Assessing natural recruitment and juvenile survival of clams in natural and artificial clam populations - Establish and assess a subtidal oyster shell habitat to rear wild stocks of clams as an extension of a natural clam population.

Crabs

Washington 1-167-R — Steve Barry — F- 22,074, S- 7,358

Coastal dungeness crab project -Sample crab at canneries, coastal ports, and on vessels to collect biological and management data.

Crayfish

Nevada 4-93-D — Donald H. Baepler — F- 40,002, S- 13,332

Assessment in Lake Mead - Conduct a resource assessment of red crayfish in Lake Mead.

Lobster:

Connecticut 3-374-R — Mark Blake — F- 20,000, S- 20,000

Connecticut lobster investigations - Study adult population characteristics, reproductive abnormalities, larval ecology, and juvenile abundance of American lobster in Long Island Sound.

Maine 3-407-R — Jay S. Krouse — COMPLETED 1987

Lobster stock assessment - Monitor biological and socioeconomic conditions, refine estimates of population parameters, and investigate stock-recruitment relationship, reproductive potential, and movement/growth/distribution of juvenile lobsters. Information resulting from previous phases of this study has provided critical data for a lobster management plan not only for the State of Maine but also the New England Fishery Management Council.

New York 3-425-R Phillip T. Briggs F- 71,500
S- 71,500

American lobster investigations in New York waters - To conduct biological investigations on American Lobster in Long Island Sound. Catches from commercial fishermen will be sampled for size composition, sex ratio and cull rate; individual lobsters will be tagged and returned to the water to determine local movements. To determine potential fecundity of the female lobster population. Study results will be used to evaluate lobster management in both Long Island and Block Island Sounds.

Mussels

Illinois 3-373-R Richard E. Sparks F- 0
S- 0

Effects of fleeting areas on mussel beds - Determine effects of a new river terminal and barge fleeting area on existing mussel bed in the Illinois River.

Illinois 3-427-R Richard E. Sparks F- 20,000
S- 6,667

A survey of the unionid mussel population of a known quality mussel bed of the Mississippi River - To investigate species composition, density and distribution, reproduction, recruitment and mortality rate of selected mussel populations in the Mississippi River. Determine the effects of commercial exploitation and industrial/domestic/agricultural pollutants. Data collected will enable managers to protect and potentially enhance the production of the freshwater mussel resource of the Upper Mississippi River.

Kentucky 2-437-R James Axon F- 20,000
S- 6,667

Occurrence and distribution of freshwater mussel species in Kentucky - A literature search for records of mussels collected or harvested in Kentucky waters since 1900.

Tennessee 2-420-R J. Earl Hayes F- 45,000
S- 15,000

Commercial mussel resources management - Collect data on raft shell culture in order to compare growth rates and apparent health of cultured shells in comparison to wild shells in the same area.

Tennessee 2-438-R J. Earl Hayes F- 42,500
S- 14,167

Commercial Mussel resources management - Collect data on the mussel resource in the study area that has the status of a sanctuary with no harvest being allowed. Obtain data from mussel harvesters, exporters, etc., to establish harvest levels on size, number and total tonnage.

Oysters

Delaware 3-411-D(4b) Richard Cole F- 160,000
S- 0

Delaware oyster bed restoration - To begin restoration efforts for the American oyster population in Delaware Bay that have been severely damaged by the disease organism MSX. Oyster shell cultch

will be planted to expand natural oyster beds and provide new substrate for settling oyster spat. An active natural oyster bed cultivation program will be developed to sustain seed producing potential of these areas.

Maryland 3-422-D(4b) George E. Krantz F- 1,435,000
S- 0

Development of Chesapeake Bay oyster management strategy - To develop a Chesapeake Bay oyster management strategy to restore the American oyster resource in Maryland waters that has been severely damaged by the disease organism MSX. Project activities will include: 1) planting of shell on natural oyster bars which will provide new substrate for larval attachment; and 2) planting of seed oysters to supplement natural spat set.

Mississippi 2-435-R Rick Leard F- 101,695
S- 33,898

Evaluation of methods to depurate oyster (**Crassostrea virginica**) Select a site, construct and equip an on shore depuration facility to test cleansing of contaminated oysters.

New Hampshire 3-414-D John Nelson F- 24,200
S- 8,067

Improvement of American oyster, **Crassostrea virginica,** beds in the Great Bay Estuary - Enlarge and enhance habitat of American oyster, Crassostrea virginica, stocks by artificially improving bottom sediments; reduce and/or eliminate predation by the oyster drill, Urosalpinx cinerea.

New Jersey 3-424-D(4b) Thomas McCloy F- 202,500
S- 0

Emergency oyster seed bed revitalization project - To improve the production potential of oyster producing areas of the State with emphasis upon those beds which lie within the confines of Delaware Bay. Qualitative, bottom sediment investigations will be undertaken on known seed beds to determine their oyster producing potential. To transplant both shell cultch for spatfall enhancement and oyster from upper to lower beds in the Delaware Bay.

Virginia 3-423-D(4b) F. Ben Daniel F- 202,500
S- 0

Restoration of Virginia's oyster resources. To restore and return to production, those oyster grounds devastated by the oyster disease MSX and Dermo. Prior to the onset of oyster spawning, seed oysters will be harvested and transplanted to up-river sites, beyond the existing range of the diseases. In addition, oyster shell will be planted as cultch to ensure sufficient available shell surface for attachment of oyster larvae.

Scallops

Rhode Island 3-400-R John Karlsson F- 37,950
S- 37,950

Examination of bay scallop (Argopecten irradians) reproductive cycles - Perform histological study of gonad development and gamete transport in bay scallops collected from Rhode Island coastal ponds to ascertain differences in spawning patterns and strategies. Knowledge attained under this study regarding the variables

associated with fluctuations in scallop recruitment will be useful in management and stabilization of scallop populations.

Shrimp

Washington 1-183-R Barbara McIntosh F- 24,605
S- 8,202

Pink Shrimp Study - Conduct survey cruises and monitor coastal pink shrimp landings to collect biological and management information.

Squid

Oregon 1-174-R Richard Starr F- 42,283
S- 14,095

Squid Resource Assessment - Monitor squid landings to characterize stocks, map areas of harvest and begin population modeling studies.

Gear Analysis

Michigan AFC-15 Kelley Smith COMPLETED 1987

Evaluation of anadromous fish gillnet mortality in trap nets - Evaluate the gillnetting mortality rate of standard and modified large trap nets by species and numbers gilled, season, and depth. Study data will be evaluated to determine the need for additional management and regulatory measures to enhance the conservation of anadromous fish species in Lake Michigan.

North Carolina 2-439-R Michael W. Street F- 20,000
S- 6,667

Evaluation of Certified Trawl Efficiency Devices (TEDs) in North Carolina's nearshore ocean - Will test designs relative to shrimp retention and reduced catch of finfish.

FISHERIES SURVEYS

Alabama 2-421-R Walter M. Tatum F- 304,200
S- 101,400

Research and management of Alabama coastal fisheries - Monitor the abundance of larval, post larval, juvenile and adult shrimp, fish, crabs and oysters in Alabama waters and recommend harvest regulations.

Arkansas 2-432-R Tommie Crawford F- 61,900
S- 20,633

Commercial fisheries survey - Estimate value of and identify changing trends in the wild commercial fishery & aquaculture industries in Arkansas. Determine the value of fish farming industry. Gather basic life history data for use in managing paddlefish.

California 4-79-D Richard Klingbeil F- 196,860
S- 65,620

Southern California commercial fisheries assessment - Monitoring of southern California fishery resources at wholesale fish dealers.

Assessment of interactions between gill nets and marine mammals. Assessment of harbor porpoise and harbor seal population.

California 4-89-D Eugene Fleming F- 167,327
S- 55,776

Assessment and management of commercial fisheries - Obtain and analyze biological and landings data on southern California commercial fisheries.

Florida 2-408-R Karen Steidinger F- 323,436
S- 107,812

Size composition of blue crab - Determine size composition and movements of blue crab in Apalachee Bay, Charlotte Harbor and 10,000 Islands. Determine handedness, claw breakage and regeneration of stone crabs harvested by Florida west coast fishermen. Determine genetic identity of various stocks of red drum to assess the hypothesis of multiple isolated populations. Determine age, growth, reproduction, etc., for groupers; and effects of current fishery practices of sub-legal spiny lobsters.

Georgia 2-424-R James L. Music F- 160,267
S- 53,422

Studies and Assessment of Georgia's marine fisheries resources - Monitor penaeid shrimp and blue crab populations in Georgia estuaries for shellfish management decisions. Increase data base knowledge of selected aspects of life histories of Georgia's major coastal finfishes and shellfish. Determine movement and growth of commercially important penaeid shrimp in estuarine and coastal marine waters.

Kentucky 2-429-R Tom Timmon F- 16,900
S- 5,633

Exploitation rates, movements and population size of commercial fish species at Kentucky Lake - Estimate rate of exploitation of commercial fish species by gear type of commercial and sport fishermen. Determine movement of tagged commercial fish species. Determine percent tag loss of spaghetti tags on commercial fish species in large sub-impoundments.

Massachusetts 3-409-R Arnold Howe F- 60,700
S- 84,200

Massachusetts fishery resource assessment - Monitor coastal distribution, abundance, size composition and health of fishery resources inhabiting inshore and coastal waters of Massachusetts.

Minnesota 3-393-R John Spurrier F- 16,200
S- 5,400

Lake Superior commercial fisheries assessment studies - Ascertain and monitor the status of the lake trout and commercial fish stocks in the Minnesota waters of Lake Superior. Project data will be analyzed to aid decision making in the rehabilitation and utilization of these resources.

Mississippi	2-422-R	Thomas D. McIlwain	F- 420,000 S- 140,000

Mississippi Gulf coast fisheries monitoring and assessment program - 1) Assess finfish stocks in Mississippi Sound and adjacent waters with emphasis on spotted seatrout, red drum and striped mullet. (2) Collect and analyze data on the condition of oyster reefs to determine numbers of live oysters, marketable oysters, number of spawnable oysters, incidence of diseases and predators. (3) Monitor white and brown shrimp post larvae in coastal Mississippi waters.

New Jersey	3-405-R	James W. Joseph	F- 73,800 S- 73,800

Inventory of New Jersey's estuarine shellfish resources - Continue development of updated distribution/inventory information on New Jersey's estuarine shellfish resources with an annual dockside value in excess of 5.1 million dollars. Project emphasis is directed toward assessing productive capability of various shellfish areas, determining critical environmental conditions and maintaining successful management programs.

New York	3-403-D	James Redman	COMPLETED 1987

Sanitary examination of shellfish lands - Monitor bacteriological and fecal coliform levels of shellfish harvesting areas to determine compliance with state certification and water quality standards. Previous project activities have reduced the risk of certified shellfish lands being implicated in disease outbreaks and have helped to maintain consumer confidence in the safety of shellfish consumption.

North Carolina	2-419-R	Michael W. Street	F- 250,000 S- 83,333

North Carolina commercial finfish assessment - Collect, analyze and report information on North Carolina finfish operations for use in management of the fisheries and preparation and implementation of state and interjurisdictional management plans for the fisheries of species involved.

Puerto Rico	2-428-R	Aida Rosario Graciela Garcia	F-1,324,000 S- 441,333

Puerto Rico commercial fisheries research and development program - (1) Monitor the commercially exploited reef fish and spiny lobster resources to determine distribution, relative abundance and seasonal population fluctuation. (2) Provide an efficient and reliable mechanism for recording size and value of the harvest of commercial fishermen in PR. (3) Plan, coordinate and supervise the commercial fisheries research and development program to assure the continuity of Puerto Rico's aquatic resources.

Rhode Island	3-408-R	Timothy R. Lynch	F- 22,830 S- 7,610

Coastal fishery resource assessment - Collect statistical data for the development of recruitment indices for commercial fishery stocks in Rhode Island coastal waters. Biological parameter information will be used for designing management measures in State waters which are responsive to year class fluctuations and the dynamics of the respective fisheries.

Texas	2-427-R	Larry McEachron	F- 484,000 S- 161,333

Texas commercial fisheries management program - Monitor trends in brown shrimp, white shrimp, pink shrimp, blue crab and Eastern oyster relative abundance and size. Population status to be used to determine management regulations.

Virgin Islands	2-411-R	James Beets	F- 82,900 S- 27,633

Assessment of the population dynamics of snapper/grouper spawning aggregations - To identify areas used for spawning to determine the seasonality and assess the fishing pressure on aggregations to recommend management plans. Baitfish survey to determine seasonality, species, composition, abundance, distribution and commercial value in order to achieve the optimum sustained use of this resource.

Washington	AFC-129	Richard Lincoln Curt Knudsen	COMPLETED 1987

Quantitative analysis support - Develop experimental design procedures to evaluate and refine age and stock identification assessments using scale patterns.

Washington	1-168-R	Steve Barry	F- 27,158 S- 9,052

South coast marine fish/shellfish monitoring - Monitor landings and obtain biological data on groundfish, shrimp, clams, and crabs for improved resource management.

Washington	1-170-R	Alan Millikan Jack Tagart	F- 39,689 S- 13,230

Marine fish management and stock assessment - Collect and analyze stock assessment data from port samplers, log. books and research cruises to implement and monitor the Pacific Fishery Management Council groundfish management plan.

Wisconsin	3-382-R	Lee Kernen	F- 20,000 S- 6,666

Management of a quota-controlled commercial chub fishery- Determine the population parameters required to annually calculate harvest quotas for the Lake Michigan commercial chub fishery with the ultimate objective of sustaining a harvest of 4 million pounds per year by 1991.

STATISTICS

California	4-73-D	Eugene Fleming	COMPLETED 1987

Fisheries monitoring and assessment, 85-87 - Sampling program of dockside commercial landings and market supply of southern California fishery resources.

California	4-82-D	Carol Jacop Dixie Howell	F- 86,311 S- 142,864

Marine statistics support program - Provide data processing and

data entry support to improve the Pacific Fisheries Information Network.

Hawaii 4-80-D Alvin Katcharu F- 58,007
S- 19,336

Upgrading Hawaii's Commercial Fisheries Information System- Acquire computer hardware and software to permit rapid processing and analyses of data. Design and implement data quality control procedures, improve fish reporting forms, handling of completed forms, and provide fishermen with information feedback.

Hawaii 4-92-D Jerry M. Sakuda F- 113,110
S- 37,708

Hawaii small scale fishing vessel survey - Determine the size of the commercial and recreational harvest of the small scale commercial vessel fleet.

Kansas 2-430-R Jim Stephens F- 50,700
S- 16,900

Kansas marketable fisheries investigations - Provide an information base to determine the benefit of aquatic resources to commercial industries and consequently the industries' contribution to the state's economy.

Maine 3-396-D Edwin Creaser F- 16,744
S- 16,745

Collection of landings data and biological sampling of commercial fisheries landings - To collect and analyze commercial fisheries landings data by species and gear from Maine coastal ports between Rockland and the Canadian border. Landings samples will also be collected for groundfish, sea herring, and selected shellfish species to provide management information on biological parameters including size, age, sex ratio, and fecundity.

Maryland 3-413-D Christopher Bonzek F- 107,300
S- 107,300

Maryland fisheries statistics - Maintain a comprehensive catch reporting system which focuses on the harvest, value and effort of Maryland's commercial fisheries. To expand the present biological sampling database for the inclusion of several new economically important species. Analysis of this data will allow the development and implementation of fisheries management models and plans.

Massachusetts 3-416-D Charles O. Anderson, Jr. F- 112,613
S- 86,572

Fisheries statistics and automated data processing - Compile, through computer entry and analysis, all required reporting forms submitted by Massachusetts commercial fishermen and licensed finfish/shellfish dealers. Monitor the effectiveness of the Shellfish Transaction Tracking System, which traces any shellfish transmitted disease outbreak back to its source.

Nebraska 2-402-R Gene Zuerlein F- 49,082
S- 16,361

Nebraska commercial fishery investigations - To manage the

commercial fishery permit system and to compile and analyze the reported production and catch statistics.

New Mexico 2-431-R Mike Hatch F- 53,093
S- 17,698

Impacts of Commercial Fish Harvest - Estimate biomass and density of potential commercial species by sampling with gill nets and trawls. Estimate growth, production and potential yields. Assess potential for harvest intensity and estimate impact on game fish values.

Northern Marianas 4-78-D Nicolas Guerrero Completed 1987

Marianas Data Collection - Conduct creel surveys, collect receipt tickets from fish sales, collect data from tuna transhipment, and update vessel inventory data.

Trust Territories 4-69-D Mike Gawel Completed 1987

Regional standardization of catch data - Develop data collection system for the Federated States of Micronesia.

Trust Territory 4-81-D Toshiro Paulis F- 10,063
S- 3,354

Palau Reef Fish Subsistence Catch - Develop and implement a sampling scheme to determine the size and composition of the subsistence catch in the sixteen separate states in the Republic of Palau.

Trust Territories 4-84-D Steve Mullers F- 21,623
S- 9,700

Marshall Islands fishery statistics - Develop and implement a fishery statistics reporting system in Majuro and Ebeye.

Trust Territories 4-95-D Mike Gawel F- 31,000
S- 10,333

Regional standardization of catch data - Support fisheries data collection, analysis, and storage on Pohnpei, Truk, Kosrae, and Yap.

Virginia 3-361-D Erik J. Barth COMPLETED 1987

Fisheries resource statistics and information systems - Continue efforts in the collection of Virginia's commercial finfish and shellfish catch statistics and harvester employment information.

Virginia 3-417-D Lyle M Varnell COMPLETED 1987

Commercial fisheries statistics information systems - Continue efforts in the collection of finfish and shellfish catch statistics to allow assessment of the commercial component of total landings in Virginia waters. Analysis of this data will provide information necessary for determining effects of fisheries management decisions and developing fishery management plans.

Virginia 3-421-R Joseph G. Loesch F- 26,600
S- 8,868

Assessment of Commercial fishing effort in Virginia - Collect fishing effort data for pound nets and gillnets in Virginia's James, York and Rappahannock River commercial fisheries. Study results will provide information needed for the formulation of rational State management strategies for striped bass and shad/river herring. The project also directly addresses research concerns stated in the interstate management plans for these species.

Virginia 3-428-D Lyle M. Varnell COMPLETED 1987

Fisheries resource statistics and information systems - To collect, compile and process catch data information pertaining to Virginia's commercial fisheries landings. Data gathered will focus on 1) area fished, 2) gear used, 3) species caught, 4) dockside value, and 5) landing location. Effort statistics will be collected from harvesters, seafood dealers and processors. Analysis of this data will provide information necessary for developing fishery management plans.

West Virginia 3-372-R Fred Leckie COMPLETED 1987

Commercial fishery investigations - Administer and monitor the Ohio River commercial fishery in West Virginia.

REGIONAL HIGHLIGHTS

The Grant-in Aid for Fisheries Programs (Pub. L. 88-309, Pub. L. 89-304) have, since their inception, provided financial assistance to the States and territories for purposes of developing and enhancing the commercial and anadromous fisheries of the United States. Most of the funds have been used for acquiring resource and fisheries information needed for many management decisions. Prior to 1976, the funds were directed almost exclusively at the management of intra-and interstate fisheries. Since the passage of the Magnuson Fishery Conservation and Management Act of 1976, the percentage of the Federal funds directed at cooperative State-Federal management of the fisheries which fall under the purview of the Act has increased to approximately 60 percent.

Effective October 1, 1987 the Commercial Fisheries Research and Development Act (Pub.L. 88-309) was repealed. So this is the last report that lists new projects funded under Pub. L. 88-309. On going projects will be reported on in following years, however, new projects will be funded under Title III of Pub.L. 99-659, the Interjurisdictional Fisheries Act of 1986, which became effective October 1, 1987.

The following regional highlights describe the contributions these programs make to the management of the commercial and anadromous fisheries of the United States.

NORTHEAST REGION

With the implementation of the Interjurisdictional Fisheries Act of 1987, the continuance of activities under P.L.88-309 draws to an end. The following summary exemplifies the strides of the P.L. 88-309 program accomplishments during the 21 year legislative history of this state-federal partnership.

Funding support to the Northeast Regional States under P.L. 88-309 for collection, evaluation, and dissemination of commercial fisheries statistics first began during 1966. At that time, most fishery statistics programs lacked continuity in both species coverage and data gathering techniques. This situation, and the availability of grant-in-aid funds prompted Massachusetts, for example, to assess new and improved methods for acquiring biological and economic data for the coastal and off-shore weir, trap, seine, lobster, alewife and shellfish fisheries. Procedures were developed for each fishery, aimed at standardizing the information to be collected and improving reporting efficiency. Subsequent project emphasis was directed at evaluating the data collection system for determining new methods to further enhance and increase reporting accuracy, timeliness of data submission, and coverage of all commercial fishery statistics. Although data gathering techniques have remained essentially unchanged (i.e. first hand collection of fisheries data by means of personal interviews at various ports of landing or from the submission of monthly reports which document daily fishing activities), this has not been the case regarding data compilation and analysis.

Prior to 1982, most data was manually tabulated, analyzed and disseminated. During the mid 1970's, project objectives included strategies for eventual computerization of all fisheries statistics. The initial stages focused on developing prototype activities which would decrease the amount of time spent on tabulating the data. Through trail and error, a system has been evolved whereby, after the raw data has been entered manually onto the computer, subsequent tabulation, analysis and dissemination of data is computerized. In 1966, Massachusetts was the first Northeast state to initiate a statistics program under Pub. L. 88-309; soon thereafter, the States of Connecticut, Maine, Maryland, New Hampshire and Virginia soon began their own statistical programs funded under this legislation.

These great strides in fisheries data handling and processing facilitated the creation of the Atlantic States Marine Fisheries Commission's Northeast Statistical Program. The Program's objective was to create a central computer processing facility incorporating all of the Northeast coastal states' fishery harvest information. This system would enable rapid retrieval of fishery data

pertaining to research, management, assessment, and statistical reporting, and is appropriately named the Northeast Fisheries Information System (NEMFIS).

The Northeast coastal states and the National Marine Fisheries Service are continuing to coordinate responsibilities in the development of Memoranda of Understanding (MOU) for the collection and exchange of confidential fisheries statistics. These MOU's are an integral part of the NEMFIS program. Before acceptance into the program, each state must have sufficient legal authority to enter into this cooperative initiative. At present, the States of Maine, New Jersey, and New Hampshire are eligible and have agreed to participate in NEMFIS activities. The creation and future implementation of NEMFIS will take statistical programs closer to the goal of developing a standardized, adaptable program to meet the requirements of state, interstate, and federal fisheries agencies responsible for management of marine resources within the internal waters and territorial seas of the individual states, and the Exclusive Economic Zone.

Public Law 88-309 funds have also been utilized for resource assessment and population monitoring studies conducted along the Atlantic Seaboard and Great Lakes Region. In the Atlantic coastal states, resource assessment projects have provided the mechanism for a variety of research data to be collected through surveys designed to meet state and federal management needs concerning the status of various fishery stocks. These surveys collect pertinent data which includes life history information, stock composition, population structure, catch and effort data, and distribution/abundance trends for targeted species.

In the inland states, population monitoring studies have been fundamental in providing additional fisheries data to scientists and fishery managers which complement data obtained through regional and lakewide assessment surveys. Examples of such projects range from the first Pub. L 88-309 investigation in Michigan (1966-72) which evaluated the success of lake trout restoration and sea lamprey control efforts in Lake Michigan to the last program study (1987-88) funded in Vermont to assess the winter yellow perch fishery in Lake Champlain.

This valuable assortment of information has been and continues to be utilized by state and federal resource management agencies, fishery management councils, and interstate commissions in the development and monitoring of inland and coastal fishery management plans. It can be expected that this valuable interchange of study data for multi-jurisdictional fish stocks will continue under the grant-in-aid program successor to the Pub. L. 88-309 legislation --i.e., the Interjurisdictional Fisheries Act of 1986.

During the final year of appropriations under the Commercial Fisheries Research and Development Act, funds were allocated to the States of Delaware, Maryland, New Jersey, and Virginia under the resource disaster provisions (Section 4[b]) of the Act to restore the commercial oyster fisheries in Chesapeake and Delaware Bays. The drought conditions experienced by these Mid-Atlantic States beginning in the early 1980's have reduced freshwater runoff, resulting in increased salinity values in the two watersheds. This situation, unfortunately. has fostered a favorable environment for the spread of "Dermo" disease and the haplosporidian parasite, commonly known as MSX. As a result, high mortalities and reductions in yield of marketable oysters have occurred, and adverse resource conditions could continue through 1990. Project activities conducted by the four states are emphasizing short-term restoration measures with two primary components: (1) planting of shell on natural oyster bars which replaces cultch removed through fishing and provides new substrate for oyster larval attachment (spat set); and (2) planting of seed oysters on specific bars (grounds) to supplement natural spat set. In Maryland alone, the objective of this management and restoration program is expected to return resource productivity to a level capable of supporting an annual harvest of 2.0-2.5 million bushels (estimated value of over $60 million).

SOUTHEAST REGION

The 17 states, the Commonwealth of Puerto Rico, and the U.S. Virgin Islands that constitute the Southeast Region represent a great diversity of fishery resources. This Region is one of the largest producers of commercial fisheries with landings valued at approximately $1 billion a year. Over 11 million recreational anglers land 40% of the region's edible finfish, which is 50% of the recreationally

caught fish in the U.S. In 1987, the $1.7 million in Pub. L. 88-309 and the $169,500 in Pub. L 89-304 funds that were allocated to the states of the Southeast Region were expended to support the management of marine and freshwater fishery resources that are invaluable to their economy.

The inland states of Kentucky, Nebraska, Missouri, Arkansas, Oklahoma, and Kansas continued to monitor commercial fisheries such as buffalo, paddlefish, quillback, gizzard shad and mussels, in streams and reservoirs for commercial fisheries management. New Mexico continued to test methods of mass-harvesting carp, white suckers and buffaloes from small reservoirs. Tennessee continued the survey of the distribution and abundance of mussel resources to determine projected needs for state regulations. Iowa initiated a study of the spawning and early life history of paddlefish and shovelnose sturgeon to determine habitats and other physical factors that are required for successful reproduction.

The coastal states are continuing to collect information to develop a data base for the management of their fishery resources. These projects not only support the management of commercial fisheries in the state's territorial waters but, the information is also important in developing, implementing, and evaluating fishery management plans of the South Atlantic, the Caribbean and the Gulf of Mexico Fishery Management Councils, as well as plans generated by the Gulf States Marine Fisheries Commission, the Atlantic States Marine Fisheries Commission, and the states. The Gulf of Mexico states utilized the funds to monitor king mackerel, spiny lobster, blue crab, stone crab, oysters, shrimp and other marine fishery resources. Mississippi has selected a site and is preparing to build a facility to test and evaluate various methods of oyster depuration.

The South Atlantic States continued fishery resource monitoring activities in support of the territorial sea and U.S. exclusive economic zone (EEZ) fishery programs. Georgia is conducting research and assessment of shrimp and finfish (spotted seatrout and red drum). North Carolina continued the finfish (Atlantic croaker, menhaden, weakfish, harvestfish, spot and bluefish) assessment work and initiated a study of testing and evaluating the certified trawl Efficiency Devices (TEDs) in the nearshore ocean. South Carolina is conducting a study on the subtidal hard clam populations for future development. All of these activities are adding important data for the management of interjurisdictional fisheries of the territorial sea and U.S. EEZ.

The Commonwealth of Puerto Rico is continuing to gather information on reef fish and spiny lobster. The Virgin Islands are assessing the population dynamics of snapper/grouper spawning aggregations as well as conducting a baitfish survey.

Mississippi, South Carolina, North Carolina and Auburn (Alabama) University, Georgia and Texas participated in the anadromous Fish Conservation Program. Mississippi continued its cooperative striped bass program with the National Marine Fisheries Service and Alabama to restore coastal striped bass populations to their historic levels. North Carolina is continuing to monitor Alosid (river herring and shads) species. Georgia is assessing biotelemetry studies of Atlantic Sturgeon and Texas is conducting a literature review to determine the historical distribution of striped bass to formulate a strategy for their restoration and management.

NORTHWEST REGION

In FY87, the nine States comprising the Northwest Region received $333,500 under the Commercial Fisheries Research and Development Act (P.L. 88-309) and $1,020,500 under the Anadromous Fish Conservation Act (P.L. 89-304). About one-third of the Regional P.L. 88-309 allocation supported projects for the fisheries agencies of the six inland states; Colorado, Idaho, Montana, South Dakota, Utah, and Wyoming. The majority of the appropriated P.L. 88-309 and P.L. 89-304 funds supported Oregon and Washington projects vital to the management of the major interjurisdictional commercial ocean fisheries in the Northwest; i.e., salmon and groundfish.

All Northwest Region Pub. L. 89-304 funds have been applied to the conservation and management of the Pacific salmon fishery. Historically, the Pacific salmon fishery is the most valuable and most controversial fishery in the Northwest; the amount of salmon harvested yearly by the states is considerably less than the amount of groundfish harvested, but the resource itself is worth at least three

times as much. Problems within the fishery are a result of dwindling stocks, a highly mobile and overcapitalized commercial fishing fleet, increasing recreational interest, obligations to treaty Indian tribes, obligations under the U.S.-Canada Salmon Treaty, and the necessary interaction of a myriad of affected state, federal and tribal management entities. The ocean fishery has been regulated and coordinated under the Pacific Fishery Management Council's (PFMC) Salmon Fishery Management Plan since 1978. Management of mixed stocks, some of which are depressed, requires continuous data collection, analysis, and monitoring of the catch coast-wide to meet escapement and allocation goals. Pub. L. 89-304 funding has been essential for these efforts. As management data needs have become more critical, Pub. L. 89-304 program emphasis has shifted away from enhancement techniques and basic research.

The majority of the Northwest Region Pub. L. 89-304 funds in FY87 were utilized in projects that collect and analyze fisheries data essential for Magnuson Fishery Conservation and Management Act management. These projects include tasks which monitor ocean salmon fisheries, assess spawning escapements, apply coded wire tags to hatchery released salmon, recover and decode tags from commercial and recreational fisheries, identify salmon stocks, and assess salmon stock abundance and distribution. About 15 percent of the coastal states' Pub. L. 89-304 funds were used for applied research in FY87. Oregon continued monitoring the natural and artificial production of chinook and coho in coastal streams, and conducted studies to determine the limiting factors in the estuarine and ocean survival of salmonids. Washington continued efforts to develop new stock identification techniques such as otolith banding experiments and also continued efforts to further refine and improve genetic stock identification methods.

The majority of the P.L. 88-309 funds provided to Washington and Oregon were utilized in regional groundfish, pink shrimp, and Dungeness crab studies necessary for the management of these interjurisdictional species. These funds provide for a major portion of the catch sampling and biological data activities needed for regulation of Washington's Dungeness crab fishery which depends heavily upon the results of the shell condition monitoring program funded by P.L. 88-309. Groundfish, which is managed coast-wide under the PFMC Pacific Groundfish Management Plan, and shrimp and Dungeness crab, which are managed under a multi-state cooperative effort, account for the majority of the commercial fishery resources in the coastal states. In Oregon, groundfish accounts for 48% of the fishery catch by weight while pink shrimp and Dungeness crab together make up 34% of the total catch by weight. In Washington, groundfish accounts for 52% of the total fishery catch by weight, while pink shrimp and Dungeness crab make up another 27%. In 1986, an estimated 264 million pounds of fish and shellfish were harvested in Washington and Oregon's commercial fisheries; the estimated ex-vessel value of this Northwest coast harvest is over $155 million. Pub. L. 88-309 and 89-304 grant programs supply funds essential to the management of these commercial fisheries in the Northwest Region. With the aid of these funds, both Oregon and Washington are able to fullfil their responsibilities that are vital to fisheries management such as: (1) acting as caretakers of the marine habitat and living resources within state waters. (2) operating salmon hatcheries, (3) cooperating with adjacent states in similar management tasks, (4) assisting in management of resources under federal jurisdiction and (5) working in the context of international fishery management entities.

Inland water programs, funded under Pub. L. 88-309, in FY 87 were divided between those contributing to development of improved harvest management strategies and those contributing information needed to develop or maintain successful fish culture efforts. Wyoming's projects centered on the possible development of a limited access catfish fishery by assessing the potential for such a fishery. Colorado proposed two projects for funding in 1987. Their first project involved assessing the feasibility of catfish cage culture in Colorado reservoirs and their second project dealt with fish farm and natural spawning ground disease and parasite control. Idaho and Utah also used their Pub. L. 88-309 funds for disease control projects. Utah continued with its disease monitoring and certification program for commercial trout hatcheries. In segment two of their disease control project, Idaho worked on developing a neutralizing antibody against the IPN virus. Montana continued their reservoir stock assessment studies to refine and update the existing data bases on goldeye, cisco, and spottail shiners while South Dakota continued their studies on the abundance and distribution of rainbow smelt populations using hydroacoustic survey methods.

SOUTHWEST REGION

The first year of upgrading Hawaii's data collection system was completed by the end of 1987. The objectives of the project are to improve the quality of the data submitted by fishermen, improve data processing capabilities, and increase the analytical capabilities of the Department of Aquatic Resources. The project requires a redesign of the current system, involving a tracking method to ensure that required landings reports are submitted by fishermen, acquiring flexible data processing equipment, and designing programs that will provide needed information quickly and efficiently. During 1987, a great deal of progress was achieved in developing word and data processing capabilities of department personnel and in generating ad hoc reports. Processing time for editing and updating files for the annual commercial fisheries report has been reduced from three weeks to seven days. The new system will be flexible and will provide essential management information quickly.

Anadromous Fish Act funds (Pub.L 89-304) were used to supply the California's landings data in support of the Pacific Fishery Management Council's Fishery Management Plan for the Salmon Fisheries off Washington, Oregon, and California. Twenty ports are sampled regularly to determine numbers and pounds by species of salmon landed in the commercial fishery. During the sampling, heads of coded wire tagged fish are collected, and mark and recovery data are summarized weekly.

An assessment of Klamath River salmon populations was also conducted in California in 1987. The purpose of this work is to determine the size, composition, and distribution of salmon and steelhead, assess the sport fishery harvest levels, and determine the return rates of natural and hatchery produced salmon.

In summary, grant project in 1987 provided: (1) fishery aggregation devices in American Samoa, (2) biological and landings data for the California salmon and southern California pelagic fisheries, (3) data collection support for Palau, Hawaii, Commonwealth of the Northern Mariana Islands, and the Federated States of Micronesia, (4) aquaculture research in Guam, (5) assessed the potential commercial use of grass carp in Nevada, and (6) assessed the standing stocks of catfish in the lower Colorado, Salt, and Verde Rivers of Arizona to determine the potential development of a commercial fishery.

ALASKA REGION

In FY 1987, the Alaska Region received $455,000 under the Anadromous Fish Conservation Act (P.L. 89-304). This amount was augmented with $68,000 recovered from prior years' P.L. 89-304 funds, resulting in a total of $523,000. The Region apportioned $474,400 of this amount to the Alaska Department of Fish and Game (ADF&G) and $30,000 to the University of Washington's Fisheries Research Institute. The Alaska Region received $240,000 under the Commercial Fisheries Research and Development Act (P.L. 88-309). The Region apportioned all of this amount the ADF&G. These P.L. 89-304 and 88-309 monies funded FY 1987 research projects directed at the management of Alaska's commercial salmon and groundfish fisheries, respectively. The salmon segment included fisheries for sockeye, pink, chum, coho, and chinook salmon; the groundfish segment included groundfish in the Gulf of Alaska and Pacific herring in the Gulf of Alaska.

The salmon projects supported management of fisheries that had a total 1987 exvessel value (amount paid to fishermen) of about $88 million. Data obtained through the coded wire tag recovery program during port sampling aided in determining migration routes and general movements of salmon. Results were used in part for implementation of the Pacific Salmon Treaty. Data were also obtained to determine success of salmon escapements and to support decisions to open commercial fisheries in Southeast Alaska and at Chignik, Alaska.

The groundfish projects supported management of groundfish and Pacific herring fisheries that had a total 1987 exvessel value in the Eastern Regulatory of the Gulf of Alaska of over $14 million and $6.8 million, respectively. Groundfish catches where these projects were conducted total about 19,000 metric tons round weight. The herring catch totaled 8,300 mt. Most of the groundfish catch was sablefish, stocks of which are fully utilized by U.S. fishermen. Developing

fisheries for other species, particularly rockfish, have created a need for additional fisheries monitoring. Data obtained through port sampling in 1987 were used to identify rockfish species assemblages and to develop harvest guidelines for certain rockfish found inshore. Winter trawl fisheries for flounder in the internal waters of Southeast Alaska also require extensive inseason management due to reduced stock abundance of certain flounder species. Data obtained through port sampling were used for management of flounder and to minimize catches of crab and Pacific halibut. Data obtained from acoustic surveys of herring stocks in Southeast Alaska were used to establish quotas for managing the commercial harvest of herring. Data were also used to determine the success of spawning and to better understand the life history of herring.

Objectives of P.L. 89-304 projects were the following:

Southeastern Alaska Sockeye Salmon Apportionment Studies

Determine the contribution of sockeye salmon from two Southeastern Alaska lake systems to the commercial Lynn Canal drift gillnet fishery; determine sockeye salmon escapement to the two lake systems; analyze spawner/recruit relationships as a means of evaluating escapement goals, maintain escapement and catch records for all major sockeye salmon river systems and all southeastern gillnet and seine fisheries; provide technical and logistical support for U.S.-Canada salmon studies.

Southeastern Alaska Pink Salmon Studies

Develop background data and techniques to improve accuracy of forecasts of pink salmon returns in Southeast Alaska; determine optimum levels of pink and chum salmon escapement into Southeastern Alaska streams to aid in achieving the maximum sustained yield; obtain scale samples to aid in stock identification and separation; continue development of methodology to estimate total escapement (numbers of salmon returning to parent streams) for use in inseason management and post-evaluation of management strategies.

Southeastern Alaska Port Sampling

Sample chinook and coho salmon of wild and hatchery origin and chum salmon of hatchery origin to recover coded wire tags used in providing data necessary for estimating migration routes, run timing, relative abundance, and contribution rates of tagged fish; assess troll fleet performance inseason to promote attainment of salmon quotas as mandated by the U.S.-Canada salmon treaty; collect age , size and sex data from salmon catches and escapement to evaluate salmon returns from specific brood years, forecast salmon returns, and assess effects of gear selectivity.

Coded Wire Tagging of Wild Coho Stocks

Determine harvest rates by area and gear for selected coho salmon in Southeastern Alaska; determine migration routes and timing of different stocks through the fishery; estimate escapement and contribution to the fishery for each respective stock; refine management through development of escapement goals and effective management techniques.

Chignik Sockeye and Coho Studies

Provide estimates of the abundance and age composition of the sockeye salmon escapement into the Chignik Lakes that occurs after the weir for counting salmon has been removed. The resulting data will enhance understanding of the population dynamics of these stocks and improve management of commercial exploitation of the stocks.

Provide baseline information on the abundance and age composition of the coho salmon stocks returning to Chignik Lakes. The resulting data will be added to a developing data base for purposes of evaluating coho production in the watershed and forecasting adult returns.

Document sockeye salmon predation by juvenile coho salmon in the Chignik Lakes. This will be accomplished by direct laboratory experimentation, and by inference from field sampling coupled with experimental results.

Objectives of P.L. 88-309 projects were the following:

Groundfish Port Sampling

Determine domestic groundfish landings in the Eastern Area of the Gulf of Alaska by species, month, and gear type; collect biological data on key species including length, weight, sex, and maturity, using commercial fishery sources and limited resource assessment programs; continue the hook-and-line and trawl logbook programs and develop methods for timely data entry and analysis; conduct independent resource assessment and tagging cruises for sablefish and rockfish in the Southeastern area as opportunity and funding permit; implement fishery closures in State of Alaska waters and cooperate with NMFS in closing Federal waters to fishing when annual harvest objectives have been reached.

Pacific Herring Research, Southeastern Alaska

Refine and develop acoustic equipment to make reliable herring biomass estimates; conduct and evaluate acoustic assessments of major herring stocks in Southeastern Alaska for age and growth analyses as indicators of stock condition; develop, conduct, and evaluate spawning ground studies to provide life history information and spawner numbers to use as a comparison of acoustic estimates and as a basis for quotas where reliable acoustic estimates cannot be made; provide research information for inseason management of the Southeastern herring resource.

ADMINISTRATIVE ORGANIZATIONS
NONFEDERAL COOPERATORS

STATE	AGENCY	ADDRESS
Alabama	James D. Martin, Commissioner Department of Conservation and Natural Resource	State Admin. Building 64 North Union St Montgomery 36130
	Wayne. Shell Auburn University, Fisheries Department	Swingle Hall Auburn 36849
American Samoa	Ray Tulofono Office of Marine Resources Government of American Samoa	Pago Pago 96799
Alaska	Don W. Collinsworth, Commissioner Department of Fish and Game	Box 3-2000 Juneau 99802
Arizona	Temple A. Reynolds, Director Game and Fish Department	2222 W. Greenway Rd. Phoenix, 85023
Arkansas	Steve N. Wilson, Director Game and Fish Commission	2 Nat. Resrc Dr. Markham & I-430 Little Rock 72205
California	Peter. J. Bontadell. Director Department of Fish and Game The Resources Agency	1416 Ninth Street Sacramento 95814
Colorado	James B. Ruch, Director Division of Wildlife Department of Natural Resources	6060 Broadway Denver 80216
Connecticut	Dennis P. DeCarli, Deputy Commissioner, Department of Environmental Protection	State Office Bldg 165 Capitol Avenue Hartford 06106
Delaware	William C. Wagner, II, Director Division of Fish and Wildlife Department of Natural Resources and Environmental Control	P.O. Box 1401 Dover 19903
Florida	Thomas E. Gardner Executive Director Department of Natural Resources	3900 Cmnwlth Blvd Tallahassee 32303
Georgia	J. Leonard Ledbetter, Commissioner Game and Fish Division Dept of Natural Resources	Floyd Towers East 205 Butler St. S.E., Suite 125 Atlanta 30334
Guam	Mr. Harry T. Kami, Chief Aquatic & Wildlife Resources Department of Land and Natural Resources	Agana 96910
Hawaii	Mr. Henry M. Sakuda, Director Division of Aquatic Resources Department of Land & Natural Resources	1151 Punchbowl St Honolulu 96813
Idaho	Jerry M. Conley, Director Department of Fish & Game	600 South Walnut P.O. Box 25 Boise 83707

STATE	AGENCY	ADDRESS
Illinois	Mark Frech, Director Department of Conservation	Lincoln Tower Plaza 524 South Second Springfield 62701-1787
Indiana	Edward L. Hansen, Director Division ofFish and Wildlife Department of Natural Resources	607 State Office Building Indianapolis 46204
Iowa	Larry J. Wilson, Director Conservation Commission	Wallace State Office Building 9th and Grand Des Moines 50319
Kansas	Robert L. Meinen, Secretary Fish and Game Commission	900 Jackson St. Suite 502 Topeka 66612-1220
Kentucky	Don R. McCormick, Commissioner Department of Fish and Game Wildlife Resources	Arnold L. Mitchell Building #1 Game Farm Rd. Frankfort 40601
Louisiana	Virginia Van Sickle, Secretary Division of Fisheries Department of Wildlife & Fisheries	P.O. Box 15570 Baton Rouge 70895
Maine	William J. Brennan, Commissioner Department of Marine Resources	State House, Station 21 Augusta 04333
Northern Mariana Islands	Division of Marine Resources	Office of the Governor Saipan 96950
Maryland	Dr. Paul Massicot, Administrator Tidewater Administration Department of Natural Resources	Tawes State Office Bldg Annapolis 21401
Massachusetts	Philip G. Coates, Director Division of Marine Fisheries Department of Fisheries, Wildlife and Environmental Law Enforcement	Leverett Saltonstall Bldg 100 Cambridge St Boston 02202
Michigan	David F. Hales, Director Department of Natural Resources	S. T. Mason Bldg Box 30028 Lansing 48909
Minnesota	Larry R. Shannon, Director Division of Fish and Wildlife Department of Natural Resources	Box 20, 500 Lafayette Road St. Paul 55146
Mississippi	Vernon Bevill, Exec. Dir. Department of Wildlife Conservation	Box 451 Jackson 39205
Missouri	Jerry, J. Presley, Dir. Dept of Fisheries Division Conservation	P.O. Box 180 Jefferson City 65101
	Leslie S. Uhazy University of Missouri	Division of Biological Science Columbia 62211

STATE	AGENCY	ADDRESS
Montana	Patrick J. Graham, Administrator Fisheries Division, Department of Fish, Wildlife and Parks	1420 E. Sixth Ave Helena 59620
Nebraska	Rex Amack, Director Game and Parks Commission	Box 30370 2200 North 33rd St Lincoln 68503
Nevada	William A. Molini, Director Department of Wildlife	1100 Valley Rd. P.O. Box 10678 Reno 89520-0023
New Hampshire	Donald A. Normandeau, Ph.D. Executive Director Fish and Game Department	2 Hazeh Drive Concord 03301
New Jersey	George P. Howard, Director Division of Fish, Game and Wildlife, Department of Environmental Protection	CN-400 Trenton 08625
New Mexico	Bill Montoya, Director New Mexico Dept of Game and Fish	Villagra Bldg Santa Fe 87503
New York	Gordon C. Colvin, Director Division of Marine Resources	Building 40, State University of New York Stony Brook 11794
North Carolina	William Hogarth, Director Division of Marine Fisheries Department of Natural Resources and Community Development	Box 769 Morehead City 28557
North Dakota	Dale L. Henegar, Commissioner State Game and Fish Dept	100 North Bismarck Expressway Bismarck 58501
Ohio	Joseph J. Sommer, Director Division of Wildlife Department of Natural Resources	Fountain Square Building C Columbus 43224
Oklahoma	Steve A. Lewis, Director Department of Wildlife Conservation	1801 North Lincoln Okañoma City 73152
Oregon	Randy Fisher, Director Department of Fish and Wildlife	506 SW Mill Street P.O. Box 59 Portland 97207
Pennsylvania	Edward R. Miller, Exec Dir Pennsylvania Fish Commission	P.O. Box 1673 Harrisburg 17105-1673
Puerto Rico	Francisco J. Otera, Exec Dir. Marine Resources Development Corporation	P.O. Box 2629 Old San Juan Sta. San Juan 00903
Rhode Island	John A. Stolgitis, Chief Division of Fish and Wildlife Department of Environmental Management	Stedman Gvnt. Cntr. Tower Hill Road Wakefield 02879
South Carolina	James A. Timmerman, Jr. Executive Director, Wildlife and Marine Resources Department	P.O. Box 167 Columbia 29202

STATE	AGENCY	ADDRESS
South Dakota	Richard Beringson, Secretary Dept of Game, Fish & Parks	Sigurd Anderson Bldg 445 East Capitol Pierre 57501
Tennessee	Gary T. Myers, Exec. Director Wildlife Resources Agency	P.O. Box 40747 Ellington Ag Cntr Nashville 37204
Texas	Charles D. Travis Exec. Director Coastal Fisheries Branch Parks and Wildlife Department	4200 Smith School Austin 78744
Utah	William H. Geer, Director Division of Wildlife Resources State Department of Natural Resources	1596 W.North Temple Salt Lake City
Vermont	Steve E. Wright, Commissioner Department of Fish and Wildlife	103 South Main St Waterbury 05676
Virgin Islands	Alan D. Smith, Commissioner Department of Conservation and Cultural Affairs	179 Atona & Welgunst St. Thomas 00802
Virginia	William A. Pruitt, Commissioner Marine Resources Commission	P.O. Box 756 2401 West Avenue Newport News 23607
	Frank O. Perkins, Director Institute of Marine Science	Gloucester Point 23062
Washington	Joseph R. Blum, Director Department of Fisheries	Room 115 General Admin Bldg. Olympia 98504
West Virginia	Ronald R. Potesta, Director Dept of Natural Resources	1800 Washington St., East Charleston 25305
Wisconsin	Carroll D. Besadny, Secretary Dept of Natural Resources	Box 7921 Madison 53707
Wyoming	Bill Morris, Director Game and Fish Dept	5400 Bishop Blvd. Cheyenne 82002
Northern Marianas Islands	Nicolas M.L. Guerrero, Director Dept of Natural Resources Office of the Governor	Commonwealth of the Northern Marianas Mariana Islands Saipan, Mariana 96950-9729
Trust Terrt.	Administrative Officer Office of the Attorney General	Trust Territory of the Pacific Islands Saipan, CM 96950 9413
Atlantic States Marine Fisheries Commission	Irwin M. Alperin Executive Director	Suite 310 1400 16th St NW Washington, D.C. 20036

STATE	AGENCY	ADDRESS
Pacific Marine Fisheries Commission	Guy N. Thornburgh, Executive Director	Metro Center, Suite 170 2000 S.W. First Ave Portland, Oregon 97201
Gulf States Marine Fisheries Commission	Larry Simpson, Executive Director	P.O. Box 726 Ocean Springs, MS 39564

NATIONAL MARINE FISHERIES SERVICE

Northeast Region

		Contact:
Connecticut	New Jersey	Richard B. Roe,
Delaware	New York	Regional Director
Illinois	Ohio	Harold C. Mears, Chief,
Indiana	Pennsylvania	State/Federal
Maine	Rhode Island	Relations Branch
Maryland	Vermont	Federal Building
Massachusetts	Virginia	14 Elm Street
Michigan	West Virginia	Gloucester, Massachusetts
Minnesota	Wisconsin	01930-3097
New Hampshire		Phone: 617-281-3600

Southeast Region

Alabama	Nebraska	Joseph W. Angelovic
Arkansas	New Mexico	Acting Regional Dir.
Florida	North Carolina	Donald. R. Ekberg
Georgia	Oklahoma	Reg.Science Coord.
Iowa	Puerto Rico	Duval Bldg
Kansas	South Carolina	9450 Koger Boulevard
Kentucky	Tennessee	St. Pete, Fl 33702
Louisiana	Texas	Phone: 813-893-3720
Mississippi	Virgin Islands	
Missouri		

Northwest Region

Colorado	South Dakota	Rolland A. Schmitten,
Idaho	Utah	Regional Director, NW Region
Montana	Washington	Joe Scordino, Fisheries
North Dakota	Wyoming	Management Division
Oregon		7600 Sand Point Way N.E.
		Seattle, WA 98115
		Phone: 206-526-6140

Southwest Region

American Samoa	Hawaii	E. Charles Fullerton,
Arizona	Nevada	Regional Director
California	Trust Territory	James Morgan, Resource
Guam	of Northern Marianas	Management Branch
	Islands	300 South Ferry Street
		Terminal Island, California
		90731
		Phone: 213-514-6667

Alaska Region
Alaska

Robert W. McVey,
Regional Director
Ron Berg, Fisheries
Management Division
P.O. Box 1668
Juneau, Alaska 99801
Phone: 907-586-7228

PUBLICATIONS[1]

In carrying out project activities, about 300 State scientists are continuously employed to gather information to improve fishery knowledge, solve fishery problems, and better manage fishery resources. Since this report was first begun, 19 years ago, these studies have resulted in publications, many of which have appeared in scientific journals or, have been for partial fulfillment of the requirement for advanced degrees from educational institutions. In 1987, 36 new publications resulted from these grants, totalling now 811 for 19 years of projects. Of these 36 in 1987, 16 have been published in scientific journals, 13 in state publications, and 3 were part of master thesis' programs. The project number that the publication resulted from is listed in parentheses, after each citation.

Some of the reports are available from the National Technical Information Service (NTIS). NTIS sells these reports as either paper or microfiche copies. Its address is:

National Technical Information Service
U.S. Department of Commerce
Springfield, VA 22151

Anonymous. 1987. New Jersey Marine Fisheries Handbook. NJ Dept. of Envir. Protect., Div. Fish, Game and Wildlife. 39 p. (3-415-D)

Averill, P. H. and H.A. Carr. 1987. Use of square mesh in New England's groundfishery. Pages 649-651 In: Ocean 87 Proceedings. The ocean-an International Workplace (volume 2), 28 September-1 October, 1987, Halifax, Nova Scotia, Canada. Marine Technology Society and IEEE Ocean Engineering Society. (MA 3-404-D) Department of Marine Resources, Fisheries Information Series 4. 12 pp. (ME 3-368-D).

Blodgett, K.D., and R.E. Sparks. 1987. Documentation of a mussel die-off in pools 14 and 15 of the Upper Mississippi River. Pages 76-88 In: R.J. Neves (ed.), Proceedings of the workshop on die-offs of freshwater mussels in the United States, 23-25 June, 1986, Davenport, IA. U.S. Fish and Wildlife Service and Upper Mississippi River Conservation Committee. 166 p. (IL 3-373-R)

Brown, E.H., Jr., R.L. Argyle, N.R. Paynes and M.E. Holey. 1987. Yield and dynamics of a de-stabilized chub (Coregonus spp.) population in Great Lakes Michigan and Huron 1950-1984. Canadian Journal of Fisheries and Aquatic Sciences 44 (supp. 2): 371-383. (WI 3-382-R)

Burczynski, J. J., P. H. Michaletz and G. Marrone, 1987. "Hydroacoustic Assessment of the Abundance and Distribution of Rainbow Smelt in Lake Oahe." North American Journal of Fisheries Management, Vol. 7, No. 1, (1987). pp.106-116, (SD 1-173-R).

Carr, H. A., and R. A. Cooper, 1987. Manned submersible and ROV assessment of ghost gillnets in the Gulf of Maine. pp 622-624 In: Ocean 87

---

[1] Supplemental to activity report publication for previous fiscal years.

Proceedings. The ocean-an international workplace (volume 2), 28 September-1 October, 1987, Halifax, Nova Scotia, Canada. Marine Technology Society and IEEE Ocean Engineering Society. (MA 3-404-D).

Crecco, V., T. Savoy and W. Whitworth, 1986. Effects of density-dependent and climatic factors on American shad recruitment: A predictive approach. Canadian Journal of Fisheries and Aquatic Sciences 43(2): 453-463. (CT AFC-15). 1987. Review of recruitment mechanisms of the American shad: the critical period and match-mismatch hypothesis reexamined. pp 455-468 In: J.J. Dadswell et. all (eds.), Common strategies of anadromous and catadromous fishes, 9-13 March, 1986, Boston, MA. American Fisheries Society Symposium 1.561 p. (CT AFC-15

Demory, R.L. 1987. "Progress Report on the Status of Petrale Sole in the INPFC Columbia-Vancouver Areas in 1987," In: Status of the Pacific Coast Groundfish Fishery through 1987 and Recommended Acceptable Biological Catches of 1988. OR: Pacific Fishery Management Council, 1987. (OR 1-185-R)

Fabrizio, M.C. 1987. Contribution of Chesapeake Bay and Hudson River stocks of striped bass to Rhode Island coastal waters as estimated by isoelectric focusing of eye lens proteins. Transactions of the American Fisheries Society 116: 588-593 (RI AFC-4)

Fabrizio, M.C. 1987. Growth-invariant discrimination and classification of striped bass stocks by morphometric and electrophoretic methods. Transactions of the American Fisheries Society 116: 728-736. (RI AFC-4)

Figley, W. and T. McCloy. 1987. New Jersey's recreational and commercial fishing grounds of Raritan Ray, Sandy Hook Bay, and Delaware Bay; and the shellfish resources of Raritan Bay and Sandy Hook Bay. NJ Dept. of Envir. Protect., Div. Fish, Game and Wildl. Ser. 87-1. 36 p. (NJ 3-425-D)

Gallinat, M.O. 1987. Population analysis and food habits of the yellow perch. Perca flavescens (Mitchell), in Indiana waters of Make Michigan, 1984-1986. MS. Thesis-Ball State Univ. 169 p. (IN 3-387-R).

Garrison, R.L. 1987. Stock Assessment of Anadromous Salmonids. Oregon Department of Fish and Wildlife Progress Report. (OR AFC-130)

Hoopes, T. B. 1987. 1986 Massachusetts lobster fishery statistics. Massachusetts Division of Marine Fisheries, Technical Series 21. 17 pp. (MA 3-416-D).

Hunter M.A. 1988. Relative Distributions of Five Coho Stocks Caught in the West Coast of Vancouver Island Troll Fishery. Wash. Dept. of Fish. Tech. Rept. No. 103. (WA AFC-128)

Kelly, K.H. 1987. Geographic size variation in Maine Lobster. ME dept. Mar. Resour., Lobster Inform. Leaf No. 17. 13 p. (ME 3-407-R)

Krouse, J. S. 1987. Maine lobster minimum size limits: past, present, and future. ME Dept. Mar. Resource., Lobster Inform Leaf. No. 16 15 p. (ME 3-407-R)

Krouse, J. S. and E.E. Nutting. 1987. Ongoing juvenile lobster tagging studies of the 1980's ME Dept. Mar. Resourc. Rept. 3p (ME -3-407-R)

Lincoln, R. ed. 1987. Genetic Stock Identification (GSI) of Chinook Salmon: Status, Needs, and Future. Summary of a Seminar on October 24, 1986. (WA AFC-128)

Lincoln, R. ed. 1988. Genetic Stock Identification Analysis of Several 1987 Washington Ocean, Strait of Juan De Fuca, and Strait of Georgia Chinook Salmon Fisheries. (WA AFC-128)

Lorda, E., and V. A. Crecco. 1987. Stock-recruitment relationship and compensatory mortality of American shad in the connecticut River. Page 469-482 In: M.J. Dadswell et. all (eds.), Common strategies of anadromous and catadromous fishes, 9-13 March, 1986, Boston, MA. American Fisheries Society Symposium 1, 561 p. (CT AFC-15)

McKeag, K. J. 1987. An evaluation of the potential forage fish populations in Indiana waters of Lake Michigan: 1973 vs. 1984-86. M.S. Thesis-Ball State Univ. 121 p. (IN 3-387-R)

McQueen, R.K., L. Osis, and M.H. Zirges. 1987. The 1986 Ocean Salmon Fisheries. Oregon Department of Fish and Wildlife Annual Report. (OR AFC-130)

Oregon Department of Fish and Wildlife. 1987. Coho Broodstock Development and Implementation and Evaluation of the Tenmile Lakes Management Plan. Annual Report (OR AFC-127)

Osborn, Hal R., Ferguson, Maury O., "Trends in Finfish Landings by Sport-Boat Fishermen in Texas Marine Waters, May 1974 - May 1986," Management Data Series No. 119, 1987. (TX 2-400-R)

Osborn, Hal R., Quast, William D., Hamilton, C.L. "Trends in Texas Commercial Fishery Landings, 1977-1986," Management Data Series No. 131, 1987. (TX 2-400-R) (SF-30)

Overstreet, Robin M. "Aquatic pollution problems, Southeastern U.S. Coasts: histopathological indicators," Aquatic Toxicology, 11 (1988) 213-239, Elsevier. (MS 2--4322-R)

Rice, J.A., L.B. Crowder, and M.E. Holey. 1987. Exploration of mechanisms regulating larval survival in Lake Michigan bloater: a recruitment analysis based on characteristics of individual larvae. Transactions of the American Fisheries Society 16: 703-718 (WI 3-382-R)

Starr, R.M., and J.E. McCrae. 1987. Squid Resource Assessment. Segment Three Annual Report (OR-1-174-R)

Stohr, A.J. and J.E. McGowan. 1987. 1984 Results from Micro-Tagged Salmon Experimental Groups. Wash. Dept of Fish., Progress Report No 253. Olympia, WA. (WA AFC-128)

Stone, C.C. and J.J. Burczynski. 1987. An Estimate of Abundance and Distribution of Rainbow Smelt in Oahe Reservoir Using Hydroacoustical Techniques, 1986. Annual Report. South Dakota Dept. of Game, Fish and Parks, Pierre, South Dakota. (SD 1-173-R)

Tagart, J. 1988. Coastal Groundfish Management and Stock Assessment. Segment Five Annual Report. (WA 1-170-R).

Unkenholz, D., G.M. Marrone, and C. Stone. 1987. Hydroacoustics--A Management Tool for South Dakota Missouri River Reservoirs. South Dakota Department of Game, Fish and Parks Report No 87-4. Paper presented at the International Symposium on Fisheries Acoustics, Seattle, Washington June 22-26, 1987. (SD 1-173-R)

Vogelbein, W.K., Fournie, J.W., Overstreet, R.M., "Sequential development and morphology of experimentally induced hepatic melano-macrophage centres in **Rivulus marmoratus**," J. Fish Biol (1987) 31 (Supplement A), 145-153. (MS 2-422-R)

Volk, E.C., S.L. Schroder, and K.L. Fresh. 1987. Inducement of Unique Otolith Banding Patterns as a practical means to Mass Mark Juvenile Pacific Salmon. (WA AFC-128)

Wagoner, L.J. and T.E. Mickelson. 1987. Research and Development of Oregon's Coastal Salmon Stocks, Coastal Salmon Plan Development. Oregon Department of Fish and Wildlife Progress Report. (OR AFC-127)

Walton, C.J. 1987. Parent-progeny relationships for an established population of anadromous alewives in a Maine Lake. Pages 451-454 In: M.J. Dadswell et. al. (eds.), Common strategies of anadromous and catadromous fishes, 9-13 March, 1986, Boston, MA. American Fisheries Society Symposium 1.561 p. (ME AFC-25.)

Wiedenheft, W.D. 1987. Development and Management of Commercial Fishing Practices in Fort Peck Reservoir. Segment Five Annual Report. (MT 1-162-R)

Young, C.H. 1987. Pond Fertilization and Zooplankton Production for Largemouth bass (Micropterus salmoides). Master's thesis. (CO 1-169-R).

Ziskowski, J., L. Despres-Patanjo, R. Murchelano, A. Howe, D. Ralph, and S. Atran. 1987. Disease in commercially valuable fish stocks in the Northwest Atlantic. Marine Pollution Bulletin 18 (9): 496-504 (MA 3-409-R)